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LIBRARY OF CONGRESS. FEB 19 1912 SMITHSONIAN DEPOSIT.

Riter-Conley Manufacturing Company

STEEL CONSTRUCTION

Pittsburgh

THE UNITED GAS IMPROVEMENT COMPANY,

PHILADELPHIA.

—•—

BUILDERS OF

THE STANDARD DOUBLE SUPERHEATER

LOWE WATER GAS APPARATUS.

—•—

ACCURATE MEASUREMENT

OF

AIR AND STEAM SUPPLY

(PATENTED),

AFFORDING { PERFECT CONTROL OF GENERATOR FIRE CONDITIONS.

PRODUCING { UNIFORM RESULTS. HIGHEST EFFICIENCIES.

THE AMERICAN
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Our Office.

[A paper read by MR. W. R. CAUSBROOK, at the January Meeting, New Jersey Company Section, National Commercial Gas Association.]

It is probably unnecessary in these days of modern merchandizing to state that goods offered for sale should be at all times attractively displayed, and yet we do not always find the attention given to this important question of attractive display that I think should be given to it.

You have heard the old expression, "Goods bought right are half sold," and we may also say that goods displayed well are half sold, and, in addition, more than half sell themselves. In fact, how often have you gone into a store and bought an article which has been forcibly brought to your notice through being displayed attractively in a shop window.

To my mind, an all-important question is timely display. Displaying heating stoves in June is of practically no value, and the first week in September is an ideal time to show heating stoves, even though it is probably three weeks ahead of the time of actual need. Ranges can be shown the year round on the floor; but I do not think it well to display them in the window during the winter season. Fixtures are sold all the time, while portables, though sold principally during the fall season, are very good for window displays. These displays should be changed weekly, and interior displays as often, in so far as possible. Although we are compelled to show the same goods, they can be changed about. How many of us have thought what proportion of our rent is chargeable to the space in the windows as against the balance of the interior? The high cost of window rent has been one of the chief reasons why the whole construction of windows has changed during the past few years.

Some may argue that, because of limited show space, they are unable to made attractive, as well as timely, displays. Yet there is no office, however small, that cannot make its displays attractive and timely, for though you can only display, say two or three ranges, they surely can be displayed attractively, and at the right time. The consumers supplied by that office are just as much entitled to an opportunity to see the best styles of cabinets as the office with the large diaplay.

To illustrate. This year we saw in Newark a very complete assortment of ranges, among which were the very latest in cabinets, with enameled ovens, glass doors, thermometers, etc. Now, what is there to prevent any of us, no matter how small our office, to at least show

Plainfield, N. J., Office, Public Service Co.

one of these cabinets each week. This also simplifies changing our weekly displays.

In these days, when such a variety of stoves is sold by this company, there is no good reason why a 16-inch and an 18-inch oven stove of one make should not be shown at one time. Since we advocate the sale of 18-inch oven stoves, let us show the 18-inch stoves only.

Then, too, the matter of displaying secondhand ranges is a troublesome one, and I think these stoves, although we have to put them on our floor, should be kept as far apart from the new ranges as possible. And, while on this subject, how much better it would be if the stoves we remove from consumers residences could be put in shape at the shop immediately, and returned to the office, where tagged with a new selling price, we would have a chance to dispose of them at once.

Some of our offices have a bulletin on which is noted full particulars of secondhand ranges, water heaters, arcs, etc., for the guidance of the representatives, which gives them a chance to dispose of these articles to someone looking for a bargain.

There is one other thing well to mention here, something that must come home to all of us. Space in our showrooms is too valuable nowadays, and this applies to our storerooms as well, to carry shopworn or secondhand goods in any large quantities for any length of time. Another phase of this matter of shop worn goods I think it

well to dwell on here. Suppose that goods do become so much shop-worn as to be particularly noticeable. The time has then passed when people will buy at any price, and I question whether we can afford to offer them at any price. So there are only two things to do—junk them or have them refinished.

It is contrary to all principles of good merchandizing to have an attractive and timely display, which is, in reality, a picture marred by parts of the setting that are unattractive and unnecessary, and should not be. It seems wise to look over our stock as frequently as possible, to avoid over-selling a particular style of stove, since what is it that happens? First of all, annoyance to our customer, who has to wait or take something else; and trying to substitute is very bad merchandizing; indeed, at times, twice as hard to do as to make the original sale. Frequently the sale is lost, and with it goes the gas consumption, the shop work is interfered with, and the confidence of the consumer, and maybe that of his friends, is lost. People will talk, you know.

The remedy for this is to watch your stock as closely as possible; get in touch with the storekeeper; run in to see him once in a while; remember that you know what is being sold, or about to be sold. He doesn't, only as orders come in, or as you tell him. It is understood we are responsible for the commercial stock carried in our storerooms.

It is well to remember we are recognized merchants in our line and, although we should try (in many of the things we carry) to have an assortment, both in variety and price, we cannot afford to carry any article in our display that looks flimsy, shoddy, or cheap. Some people like the leaded art-glass effect in portables, while others may like, and can only afford to buy, a metal overlap portable. Have some of each; they can be sold.

Being recognized as merchants, we must remember that we should get any standard appliance for a consumer upon request, and, not (in order to influence a sale of our own appliance) tell him it will take a month or 6 weeks to get something for him, when in special cases the telephone and telegraph are at our disposal. Granted that we have the showroom and the goods, the value of each may be partially wasted, unless we make the best use of the means at our command to display them.

To illustrate. We all know that a dome to be displayed to advantage must be shown with artificial light under it. How many domes in the past have we attempted to sell the consumer by just showing the dome unlighted, and though we know the good points of our goods, if we wish to sell them, don't forget to tell them to our prospective customers. Quite often they are not as familiar with these things as we are. It should be our aim to show our goods as they will appear in use; therefore, we should have at least one of every kind of appliance we have to sell, connected, ready for demonstration purposes. These cold days have a heating stove connected up, so that, when people walk by it in your office, they will know by testing it's heat, that it is the kind they should buy when needing a heating stove.

One of the things I should like to have avoided calling attention to in this paper is that neatness in making and keeping a display is vital. No matter how well our goods are made, how costly they are, how clearly they are displayed, if neatness is not always and ever the watchword, we have not made our showrooms the success they should be. I take it for granted that all of our showrooms are swept and otherwise generally cleaned at intervals, but grimy front windows, a piece of dirty tubing that has been connected to a stove, or not connected, broken glassware, carbonized mantles, fixtures with one globe on and one off, burners without mantles or with soiled chimneys, a space left vacant in our range display, ranges and water heaters connected up with pipe that someone forgot to bronze, range oven used as a storeroom for old dust rags, fixtures never dusted, and parts not wiped off where heat from burner impinges, office floor near bookkeeper's desks littered with papers (notwithstanding that waste paper baskets have been provided), dirty cuspidors, rusty display ranges and water heaters, table with advertising matter, all jumbled up, outside arc lamps apparently not receiving frequent attention, so necessary to keep them looking right. These are all evidences of untidiness, and we can judge what the opinions of our patrons must be. An agent must keep on the watch for these things, to have the office appear as it should be.

Originality in displaying our goods in our windows should claim some thought from us, as people nowaday expect to see window displays that have been well prepared. Our goods are not easy to display spectacularly, but they can be nevertheless effectively displayed. Hardware, paints, etc., would not seem to lend themselves readily for attractive display, yet to show you what can be done with such prosaic articles, just look at the window of Hockenjos's hardware store on Broad street, opposite the C. R. R. Depot, and see what you think of their display; and every week a different one, too.

Most of our offices carry a line of electric appliances, all of which are very attractive. We have plenty of material at hand, and every one of us can, by observation of how other merchants dress their windows, learn much that will be of help to us.

It behooves us to lead the way in displaying new things as they are placed on the market. That is where we should shine, where we have *carte blanche*, both gas and electric, in unlimited quantities at our disposal and the pick of fixtures and portables.

I wonder how many of us to-night still have an upright arc hanging in our showroom, when we know the inverted arc to have superseded it long ago? How many of us have the No. 4 Reflex lamp, recently put on the market by the Welsbach Company, on display. If shown to our consumers, we could surely sell some.

The question of the value of a well appointed commercial office generally arises at the time improvements are suggested or expensive repairs contemplated. This can well be answered now from our experience, which demonstrates that the answer to the question is a reversal of the same; that is, instead of asking if a well equipped office can be afforded, the question is, "Can we afford to be without a well equipped office." It has certainly proven a good investment in many ways other than the benefit derived from our ability to show the appliances we have for sale. And we are sure that the Company has the respect of every one in the city. Whether inclined to be friendly or not, they cannot help feeling that the Company is up-to-date, and liberal, and quick to adopt the most modern of methods in dealing with the public, so they must conclude that such policy indicates a like condition in other branches, and from the start there is a feeling that we are in a position to furnish that, which at these times is the universal demand, namely, "Good Service."

Right here we should emphasize the phrase, and endeavor to see it carried right down the line to the salesman and fitter, so that the good impression first gained in the commercial office will not be lost in the handling of the order. Rather, it should be strengthened by a clear and clean sale, and a prompt and satisfactory installation.

This paper has been written with the idea of bringing home to all of us some things that escape attention because of the stress of other matters. An attractive office and showroom cannot be had without effort and worry, as the writer well knows from experience with just such matters daily.

[Continued from Page 109.]

PROCEEDINGS, SIXTH ANNUAL MEETING, AMERICAN GAS INSTITUTE.

Held in St. Louis, Mo., October 18 to 20, 1911.

First Day—Afternoon Session.—Part I.

The President announced that next in sequence comes the paper on

DETAILS IN THE MANUFACTURE OF SULPHATE,

by Mr. Howell Fisher. In the absence of the author he would ask Captain McKay to read it.

This was done by Capt. McKay.

[For the text of the paper, see Journal, Nov. 13, 1911; p. 316.]

The President then said that the last communication on the subject, which was handed in by Mr. A. B. Way, altogether concerned the bibliography of the subject. The paper would be taken as read, and its contents would appear at length in the "Transactions." In announcing that

Joint Discussion

on the four last papers was in order, the President hoped the debate would comport with the importance of the subject.

Mr. R. M. Searle said he wished to personally thank the Coal Tar Products Company for its propaganda. He knew the work the Company did before Congress, having been asked by them as many other gas men were, and having made many trips to representatives in Congress, in order to get them to sustain the tariff on sulphate without any success. The work done by Mr. McIlravy was such that its magnitude could never be really appreciated. He understood that Mr. Fisher's plant realized 95 cents per ton of coal; and without the

good work done in Germany and England by Mr. McIlravy it would have been nearer to 60 cents. The development in this country was bound to come, if gas men would boost as German gas men are boosting. He was not proselyting for the Coal Tar Products Company but for the gas business, so if they boosted in this country the total amount of sulphate of ammonia used would not be puerile, only about 3 per cent. of the total consumption. The palpable ignorance of the gas industry in this connection was something appalling. They saw the possibilities in this respect through coming into agricultural work as they had been doing in their electrical department, in the study of the recovery of nitrogen from the atmosphere and utilizing it for fertilizing work. The electric side fully realizes the loss to gas men in this respect. It was their duty to get the best possible price for sulphate of ammonia. It seemed strange it was necessary—even if necessity were the mother of invention—for a concern almost foreign to their business to tell them what was for the gas man's benefit. In one case a gas man tells an automobile man how to run his business successfully, and an outside commercial man tells them how to run another branch of it successfully.

Mr. Gartley said he understood that Mr. Fisher's plant was producing 30 pound of sulphate of ammonia, or about 7½ pounds of ammonia per ton of coal. He supposed all would agree that the amount of ammonia produced from a ton of coal was not the function of the apparatus that made it into sulphate, but of the methods used for carbonizing the coal. He understood that the Mond process would give them very much more ammonia than that. Mr. McIlravy suggested the advisability of taking up propaganda for the use of sulphate of ammonia. But did he have a way to suggest to the gas companies as particularly advantageous for them to handle their ammonia product? He also asked, in connection with Mr. Atwater's paper, if there were anybody present who had seen the Burkheiser process in actual, successful operation in Germany; whether it was true that the Burkheiser salt would require another propaganda to get the fertilizer used. Being ¾ sulphate and ¼ sulphite, its value as a fertilizer would have to be demonstrated fully to the users in this country?

The President asked the authors of the four papers to discuss them just as the oth er members did, as no one of them was the author of all four, all certainly were interested in them. He would be very glad to hear from any other member, especially from someone in answer to Mr. Gartley's question. Undoubtedly amongst the many Americans who were in Europe last summer someone must have seen this process. Unless other members wanted to further discuss the papers he should be glad to entertain a motion of thanks to the gentlemen (especially to Mr. A. B. Way) for the papers presented, which certainly held a great deal of information useful to gas men.

Capt. McKay moved a vote of thanks on the papers presented be passed to the Coal Tar Products Company. The members all fully appreciated the work they have done and the information they had given the Institute.

The President announced that the thanks of the Association were tendered to Messrs. Atwater, McIlravy, Fisher and Way for the excellent papers presented to the meeting. He now called for the

BUDGET FROM THE EDITOR OF THE WRINKLE DEPARTMENT.

[For this Budget, see JOURNAL, Nov. 20, 1911, p. 331.]

Mr. J. B. Klumpp then read abstracts from the

REPORT OF THE BUREAU OF INFORMATION,

remarking that the Bureau of Information this year had only some 10 questions submitted, the answers to which were included in this report. Where 2 replies to 1 question had been received, and did not conflict, both were given. The members had not availed themselves of the advantages that such a bureau presented, due probably to the fact that the reports were too infrequent, and the subject was not brought to their attention forcibly enough. The issuance of a periodic bulletin by the Institute would be a means of overcoming that objection, and if the questions and answers were printed and issued often to members it might create more interest and be of more value. The report, as compiled by Mr. M. Webb Offutt, Chairman, was then presented.

Discussing the Wrinkles, etc.

The President said the reports of the Bureau and of Wrinkle Department were now before them for discussion.

Mr. Searle said an item or two to which he would like to call attention to, was the wrinkle submitted by Mr. McDonald for the recovery of iron monoxide. This system had worked out so successfully and perfectly at Louisville as to resolve itself into a matter of purification; not to a determination of the amount of sulphur in the iron oxide, but what the cost of handling a bushel may be. It did not make any difference how much sulphur there was in the oxide when a box fouled, for they had to take it out. His device or wrinkle caused that work to be done much cheaper, so the feature of the wrinkle was concerned in saving of labor involved.

Mr. Fulweiler asked whether the efficiency for purification was diminished on successive recoveries; whether the iron was equally efficient for purification after recovery? [Mr. Eustace assumed the Chair.]

Mr. McDonald stated he did not make that analysis, but thought he could answer that question in a matter of fact way. Taking this recovered oxide they passed a measured quantity of H_2 through it, then took same weight of the original oxide we purchased and passed H_2S through it. The recovered oxide absorbed more cubic centimeters of sulphureted hydrogen than the original or freshly purchased oxide did. Right here he would say they sprinkled the batch with ammonia liquor and it would not absorb any sulphureted hydrogen. He rather thought that some people who attempted this matter failed to get any absorotion of sulphureted hydrogen, because they neglected to neutralize the acid in the recovered iron.

Mr. Whittaker said the Bureau of Information complained of lack of patronage, and it appeared to him not enough publicity had been given to the department. That morning 70 new members were introduced, and he had been wondering what steps had been taken to exploit their different departments for the benefit of the new members, or for other members not acquainted with these departments. It was suggested that a book or other publication be made once or twice during the year to set forth the advantages of the Institute, which would be a very good thing and which should be kept separate from the regular, formal Proceedings. Take, for instance, the Committee on Calorimetry. These gentlemen had done a large amount of work, and yet it would be a hard matter for a new member to trace the origin and the work of that Committee.

The President resumed the Chair, and a motion to adjourn until 10 A.M., the following day, was adopted.

FIRST DAY—AFTERNOON SESSION.—PART II.

The proceedings of the convention designated as Section II. were called to order in the lower hall of the Art Musuem Building at 2 P.M. Mr. W. C. Morris, of New York, occupied the Chair, and Mr. Walton Forstall, acted as Secretary. The Chairman opened the meeting by inviting discussion of the Wrinkle Reports, commencing on page 52. Mr. von Maur opened the discussion by inquiring in regard to Wrinkle No. 66, which (simplified), if anybody had ever used any other than neutral oil for oiling the diaphragm meter.

Mr. W. Forstall said that in Philadelphia they had never seen any reason to change from the neutral oil that they first started to use on diaphragm meters. At present they had about 300,000 of these meters in use.

Mr. J. W. Battin said there were shops in different parts of the country that had different meters for 4 years, and used neutral oil entirely. Up to this they had not found any occasion to make any change. The work being done satisfactorily.

Mr. von Maur said, of course, the wrinkle was not for this purpose but he would ask if anyone had any use for the dial lid on the meter.

Mr. Hellen said he believed the dial was a useful improvement in protecting the glass face of meter if for nothing more than in transportation from one job to another. They had in Rochester, N. Y., much trouble with the broken glass, and in the last 3 years they insisted on the Inspector closing the covers on the meters. On looking the matter over they noted a particular district and had no trouble from that condition. At present they seldom found a meter with a broken glass. All their meters had been changed in the last 5 years, and he thought it was very important.

A Member asked if they could not accomplish the same result by having a thicker glass?

Mr. Hellen said he didn't know about that, but going back to the time he inspected meters personally. They were more careful now in such respects than they were 15 years ago. Their methods then were very crude, especially as to handling meters, and a thick glass would be no protection, and he thought experience of to-day showed that the cover on the meter was far ahead of a thick glass cover.

Mr. A. H. Hall (New York) said they had given up the use of covers for awhile, but returned to their use, as they found they afforded better protection. He had no experience with thicker glass.

Mr. H. W. Terry (New York) as to the use of glass on meters as a dial cover, he suggested something similar to that used for automobile screens, which would not break easily. The main difficulty with that was it was a celluloid, which substance could easily take fire.

At the suggestion of the Chairman, the Institute now took up the joint paper (it was read by Mr. McCollum) by Dr. E. B. Rosa and Mr. Benton McCollum, on

INSULATION AS A MEANS OF MINIMIZING ELECTROLYSIS IN UNDERGROUND PIPES.

[For the text of the paper, see JOURNAL, *ante*, Jan. 1, 8, 15, 22 and 29.]

Having finished reading the paper proper, Mr. McCollum further said: The manifold shown deserves special attention. The experiment thus defined was made not only for the purpose of ascertaining the efficiency of the paper covering, but also to ascertain the relative merits of wrought iron and steel pipe when laid under exactly the same circumstances. When the manifold was taken up there was nothing to show that one material had shown less resistance to corrosion than the other, and while the writer was in doubt as to whether an error had not been made and similar materials used throughout the manifold, in order not to give out misleading data all mention of the fact that half of the manifold was made of wrought iron and the other half of steel was omitted. Fortunately, Mr. F. N. Speller, of the National Tube Company, came to St. Louis, and the manifold was shown to him. The surface of each of the pipes was filed so as to expose the interior. On two of the pipes black specks appeared, regardless of the depth of the filing, which indicated the presence of cinder, and suggested the material as being wrought iron. The remaining pipes showed a perfectly homogeneous surface, indicating steel. The filings were then taken from each of the pipes, and analyzed, with the following results:

No.	Carb.	Mang.	Oxides, Per Cent.	Material.
Long screw...	Trace	.12	About 2	Wrought iron.
1.....	"	trace	" 2	" "
3.....	"	"	" 2	" "
6.....	.07	.31	trace	soft steel.
8.....	.07	.31	"	" "

It is difficult to make an exact estimation of the oxides and slag in iron or steel. The original record was then compared with these results and it was found by all three methods that the results were the same; namely, the pipes on the west of the manifold are steel, and those on the east of the manifold are wrought iron. This experiment is especially important, since we here have both materials installed under precisely the same conditions, with the result that it is practically impossible to say which of the materials came through the experiment in the best condition, and it would indicate that, under these conditions at least, the difference between wrought iron and steel pipe is negligible. The writer feels free to admit that he had expected the wrought iron to outlast the steel. I also have a photograph which is particularly valuable as it shows a case of corrosion where a wrought iron nipple, a malleable iron bushing, a wrought iron coupling and a steel nipple were connected together and excavated after being in the ground 8 years. All of these fittings are badly eaten, and the wrought iron appears to be in a worse condition than the steel, but all show the short life of either material, and the great need of a protective covering; at the same time, it is only fair to the wrought iron to note that, being nearest to the main, it naturally suffered most from the electrolysis. Had the relative position of the steel and wrought iron been reversed the steel would probably have been in very much the same condition as the iron.

Discussion.

The Chairman in inviting discussion remarked that, as it was a subject in which all were interested, it should bring out many expressions of opinion.

A Member asked, in connection with a 5-inch wide insulating joint, what would be the effect of placing a piece of iron, say of an inch section, parallel to the pole, and about 2 inches from it on the distribution of that curve.

Mr. McCollum replied that the effect would be to gradually concentrate the density of discharge on the pipe and the iron. Placing a piece of pipe on the outside (indicating) would increase somewhat the density of discharge there, depending somewhat on the thickness of the pipe; but if it were comparatively thin pipe, or as the ordinary pipe would be, it would not very greatly increase the density of discharge at the point there noted. Perhaps it would reduce it somewhat right here, providing this section were thick enough so that the distance between the earth and the corresponding point over there (indicating) were materially different between the pipe underneath and that point over there; but he would not expect a very great shifting of the distribution. It might be valuable at times to put on a sleeve and connect it electrically with the pipe underneath, in which case practically all of the current would then leave the metallic connection to the sleeve outside and flow over either way of the sleeve and not the pipe itself. He thought there would be some effect towards making the distribution more uniform, if one had that in the form of a sleeve running clear around the pipe. It would not be of very great difference, however.

Mr. W. H. Fulweiler asked what was the linear distribution; or how far that extended from the pipe?

Mr. McCollum replied that, in the case of a bell and spigot joint as referred to, it is shown with a pipe 4 inches in diameter. At this point the maximum is right in here (this is where the current density is very high), extending up here in some way, and falling down about like that (indicating). At a distance of 4 or 5 inches from the joint it has become very low, so that it is within 1 inch or so that the greatest current density occurs, a very few inches back, and then practically disappears. This was so low, however, that it did not cause any particular harm. With the 5-inch, horizontal wood joint, it comes up just about like this (indicating), ultimately reaching practically the same level, the maximum being considerably less, but not sloping off as rapidly. In the case of the 5-inch joint, it came up as the curves show (just about here), to not more than ½ as high as the other, and then comes off down there something like that (indicating), all along the joint the lower this maximum came, and the further out it extended. Going back a distance, clear to the bottom of the pipe, or a trifle more, the density became quite low.

Mr. Fred. Morton asked if anyone making insulated joints had taken the precaution to prevent corrosion by simply letting an iron clutch take care of it.

Mr. McCollum said that was a very important matter, in connection with laying the joint practically. In all their experimental trials they used some sort of shield, say a hard, cardboard one, where the iron came together, to insure that there was no metallic contact. They had been very careful about that. In testing systems in practice, however, where steel joints were resorted to, they found many instances of metallic contact had occurred in joints supposedly insulated, which simply emphasized the fact that in practice, using insulated joints, great care should be taken that there was no metallic contact as to the joints between the sections of the pipe.

Mr. Graf said the points that appealed to him were those that tended towards prevention. Before the traction companies came into the field they had not heard much about electrolysis, but now they heard about electrolysis in gas and water pipes, and in the conduits of telegraph, telephone and electric light companies; and lastly, they were getting it in buildings. It seemed to him that what they were most interested in was prevention, and he took it from what Mr. McCollum said, there were ways of preventing those stray currents. It should be a matter for the trolley company, if possible, to bring back that current to where it belonged without using their property, and it would be very much cheaper for them to do it than what it would cost all the different corporations to insulate their pipes or conduits. He would like to know what the Bureau of Standards was doing in the line of prevention?

Mr. McCollum remarked that, as said in the beginning of the paper, they were endeavoring to make as comprehensive an investigation as possible in regard to all the different possibilities in connection with with this matter of electrolysis, and accordingly were looking into the various methods that may be used to minimize electrolysis. The present one was a preliminary report on one of the methods. In bringing this before the Gas Institute he did not presume to convey the idea that he thought the gas or water people should necessarily incur the expense of putting in a system of that kind. It was presented merely as one of the possible methods of keeping the current off the pipes. He saw no reason why an arrangement might not be entered into by which the railway companies would defray the expense of installing such a system, provided they could be shown that it would be effective when installed. To his mind the thing to do was to find out which of the methods was the cheapest and most effective, regardless of whither the determining led them, and when the most desirable, cheapest and most effective system was decided on, then it became a question of who should bear the expense of carrying it out. It seemed to him logical, if the railroad companies could be shown that the insulating joint system was better than others, they might prefer installing it, for the good of the water companies, rather than

be compelled to go to a more expensive or less effective system. The authors were not prepared to make any final or dogmatic statements at present with regard to the relative cost of different systems, but were studying the problem and expected to have something to say about it in the future; but for the present they had shown (and he thought the paper bore him out) that the insulating joint method can be used effectively in keeping down electrolysis, at least to a minimum; but whether or not the pipe companies or the railway companies will install this, was a question that he was not prepared to deal with at the present time.

Mr. von Maur said he didn't like to see the statement go uncombatted, that they could cure this by insulating joints. It was trespassing on his paper, but the pipe, shown on this manifold which was badly eaten was the one with the insulating joint; and, as though to disprove some of their theories, it was eaten up on both sides of the insulating joints, the manifold leading into a lamp post. It was a physical proposition. The current had ample opportunity to go wherever it wanted to without going through these pipes at all, but it seemed to eat them up. He was rather skeptical as to adopting any conclusion that is obtained from laboratory practice. He appreciated the work, and appreciated the importance of laboratory practice, but the American Gas Institute had the best laboratory in the world. It had plants all over the United States; it has operators all over the world, and if any experimenting were soon to be done, let the energetic new officers lay down the work along practical lines. As a matter of fact, the trouble with electrolysis was not usually largely in the cast iron as against lead joints or cement joints. He was anticipating a little what he would have to say later, but complications were existing in respect of this practice that the laboratory would never find. In their water systems the water heater pipe leads to that system, and the current goes through. What was it going to do when it got to the main? They had changing conditions. In this particular case he put it in to see what effect the power houses had upon it. He put in a whole street 3 or 4 blocks long for experiment, and after a year they moved the power house and everything was changed.

Mr. McCollum asked Mr. von Maur if he had ever measured the potential drop at those joints that were so badly eaten up?

Mr. von Maur replied they were not measured. Mr. McCollum spoke as to his experiments of having 15 volts, which was a voltage not ordinarily found in gas systems. The damage that was done, he believed, was traceable to the voltages.

Mr. McCollum said that while they used 15 volts, that was not on one joint, for 15 volts on a joint would probably destroy it within a few weeks. They had 15 volts on the experimental pipe system, which was about 200 feet long. In that distance they had some 25 or 30 joints in series, so that the voltage across each joint was only about $\frac{4}{15}$ to $\frac{3}{15}$ volt. He felt confident in asserting, as a result not only of their laboratory experiments, but of observations in the field in instances where joints had been in service for years, that a drop of potential of a few tenths of a volt across a properly designed joint, would not, under ordinary conditions, destroy the joint in any thing less than 20 to 30 years.

Mr. von Maur asked whether cast iron or steel pipe was meant!

Mr. McCollum said he was thinking especially of the former. Of course, steel pipe was thinner, for which reason it would go out more quickly. He admitted it was a little risky to bring steel and cast iron, or different kinds of iron, in contact with each other in the soil, as one or the other was likely to suffer damage due to galvanic action.

Mr. von Maur remarked that the one without insulated cover was not so badly eaten, to which Mr. McCollum replied it was probable there was too high a drop of potential across the insulating joints. Unless one knew that the potential was small (less than $\frac{1}{2}$ volt) he did not think the criticism a valid one. He admitted that if one put the joints far enough apart, one might have a high voltage drop across the joint and trouble would result. It was such instances that brought the insulating joint method into disrepute in some cases. Another point brought out by Mr. von Maur, he wished to emphasize very much indeed; and that was the desirability ef carrying out experiments on a thoroughly practical basis. They had been trying to do so as much as they could, and had a number of engineers working out in the field, collecting data of actual conditions. They were trying to keep as close to practical conditions as possible.

Mr. McCollum quite agreed with Mr. von Maur that the Gas Institute had the best laboratory in the world for investigation of this kind, and he would like to ask of the Institute that they co-operate with them in carrying out these investigations. Nothing else would contribute more to the value of these experiments than the co-operation of the various engineering bodies. It was the purpose of the Bureau of Standards in this work, as in practically all other lines of engineering research which it was carrying out, to keep as closely as possible in touch with organizations of practical men. He hoped that some arrangement might be made by which not only the Gas Institute but the water works societies' and railway companies as well might be brought into co-operation in connection with this work. A good many are already co-operating with them individual ly, but he would like to see them co-operate as national organizations.

Mr. McCollum said those from which most of their conclusions given were made under natural conditions of the soil. He could say, however, that they had carried out special experiments in regard to the effect of acidity or alkalinity of soil, etc., and in a general way the result showed that in acid soils corrosion would take place more rapidly than is strongly alkaline soil. The effect of chemical composition of soils on the amount of corrosion that would occur under given conditions formed a subject of great importance and one of great complexity. Much work remained to be done along this line.

Mr. Hewitt (Toronto) said the importance of this matter, as it seemed to him, with its value to the gas industry as well, was the fact that the Bureau of Standards was itself taking the initiative in securing information in respect of the effects of electrolysis, and the investigation would doubtless terminate in the long run in legislation which would fix the responsibility, if there be any, upon the trolley companies. From their experience they believed the trolley companies would be only too glad to settle the damage that has already been done by the trolley system, if it could be proven against them; but having settled that damage and adopted whatever means the gas company may have agreed upon for them to adopt to eliminate the trouble, it would be up to the gas company if the remedies applied should prove non-effective. Legislation would eventually be the only thing that could fix the responsibility, and that legislation will never be obtained until the results of the investigation and experiments of the Bureau of Standards have been arrived at, and in that respect he thought they were very fortunate indeed to have given to them so much of the information that had been obtained through the experiments of the Bureau of Standards at Washington; and with the further information that he had no doubt would go to the Department from the various gas companies on this matter, they should get good results, he was sure.

On motion of Mr. von Maur a vote of thanks was tendered to Dr. Rosa and to Mr. McCollum for the paper, and to Mr. McCollum in particular for the part taken by him in its discussion. [Motion put and carried unanimously.]

The Chairman then introduced Mr. J. D. von Maur, who read his paper entitled

ACTUAL LEAKAGE IN UNACCOUNTED-FOR GAS.

[For the text of the von Maur paper, see JOURNAL, *ante*, Nov, 27, Dec. 4 and 11, 1912.]

(To be Continued.)

[CONTINUED FROM PAGE 112.]

PROCEEDINGS, FOURTH ANNUAL MEETING, INDIANA GAS ASSOCIATION.

HELD IN THE CLAYPOOL HOTEL, INDIANAPOLIS, IND., JANUARY 17 AND 18, 1912.

FIRST DAY—MORNING SESSION.

The President here introduced Mr. H. Kaufman (Wabash), who read the following paper on

SECURING NEW BUSINESS AND INCREASING THE SALE OF GAS PER METER IN SMALL CITIES.

The subject of this paper seems to apply to small cities, but the business producing ideas are applicable to the sales department of the largest as well as the smallest gas selling companies in the country. Previous to entering the artificial gas field, I had called upon a great many gas companies in the capacity of a salesman, and was always more or less surprised at the way new business was secured. It had always been my good fortune to be the introductory element of the line I sold, and brought it before the gas consumers by demonstration work, and upon entering the gas business, as a new business

manager, I made up my mind that the plans I had developed as a salesman could be carried into the commercial department of a gas company with the same success.

The plans for increasing the sale of gas are so many that you will find it impossible to theorize in the new business department. It is experience, plus ability, placed with practical and persistent work, that makes your department successful. Educate your sales' people in such a way that, when they approach a prospect, they do so with only one aim in view; namely, a sale, with a new consumer. The average salesman is whipped before the fight, for the very simple reason that he is over-trained by theory, or under-trained by experience. Salesmanship has no experiment station.

Closer relationship between consumer and local manager is the greatest asset of the management. A house-to-house canvas by the local manager of a gas office brings to him complaints that would never be given over a gas counter. When you call upon a consumer at his home, the average housewife will go into all details of gas service, and, should a complaint of any sort be given out, see that it re ceives immediate attention.

I was sent to a certain town by a gas company, whose owner thought this town was not buying the amount of gas it should. After looking the situation over for a few days, and gaining no information for such small sales, I came to just one conclusion: The citizens of this town did not thoroughly acquaint themselves with the goodwill and good service this company wished to give them. Thinking the location of the gas office would better conditions, we moved to larger quarters in the heart of the business section, fitting it up in the most modern way possible, connecting and showing all appliances that may be used in a home, and making a very extensive showing of all modern home lighting effects; in fact, making it the most inviting business house in the city. After the completion of the office, I personally called upon each and every home. After introducing myself, and acquainting the housewife with the purpose of the gas company in extending to them the best service possible, you would have been greatly surprised at the different complaints I received. A great many of the usual imaginary kind; those with the poor adjustments of range, water heater and lights, received immediate attention while on the ground. Complaints that required the attention of fitters were given as prompt attention as possible.

This house-to-house canvas was the best advertisement ever obtained. The consumers talked about it, with the result that, from then on, consumers thought the gas man surely meant business, and at once become interested, and the calls at our office were those of acquaintanceship. Each and every promise made was positively fulfilled, and we broke the ice for increasing our sales at once. Upon further investigation I found that cookery was not included in the studies of the schools in the town, and at once became busy. We equipped a model kitchen, size 30 by 30 feet, being large enough to accommodate 35 to 40 girls. I called upon the superintendent of the schools, telling her my plans of giving free cooking lessons to the girls of the eighth grades, and, if agreeable to her, after inspecting our kitchen, I would like to visit the schools and put my plans up to the pupils for organization. The superintendent's call at our office was quite beneficial. She approved our arrangements, and notified the principals to give me all the assistance and time required for organizing a cooking class.

Availing myself of this opportunity of further acquaintance, and another place to drive the wedge of good service, I called upon the different schools, acquainting the scholars with our plans and requested them to secure the permission of their parents to attend our school of cooking, and in every case the mother or father visited our office and marveled at the expense and labor we were giving free to educate their children in cookery. We explained that it was advertising pure and simple, and an education not only in the art of cooking, but in the use of the gas range. The results were: Five classes each week, and a total attendance of 165 girls visiting our office, who were continual gas boosters. In homes where any other mode of cooking was used, previous to the organization of this school, I assure you was replaced by the gas range. The school was carried on for months with continued success, and was only discontinued by reason of the fact that the public schools installed the department of domestic science.

The free use of our show windows to the ladies of the different churches to carry on their Saturday afternoon sales, meets with great approval. The results obtained by placing the gas company to the fore in everything, whether church, civil or political doings, was a gain of over 500 meters in 10 months, and an increase of over 1,000,000 cubic feet of gas per month. If this was possible in this town, you have the same possibilities in your town if the gas sales are not what they should be, and my advice is to get acquainted with your gas consumers.

Peculiar conditions exist in the average sales' department. It seems the solicitors forget that the gas companies they represent have expended thousands of dollars in the laying of mains through the streets, and on these mains there will be found hundreds of non-gas users, who, without a doubt, signed an application for gas on this particular street, but when gas was there, they either had plenty of fuel or decided not to use it. These are the consumers we want and the consumers we must have to show a profit to our company. The average solicitor does not realize or does not consider that this is the consumer he should go after and keep after until landed. It is so easy to get into a district where there is no main, that necessitates the expenditure of hundreds of dollars to lay a main; and give a few prospective consumers gas. I certainly insist that the solicitors should work the territory in which the mains are. If the gas company could have every home using gas that their lines pass, one would say there could be little room for a new business department. There are towns and cities in Indiana, as well as in other States, where natural gas was used as fuel, and at this time artificial gas is filling the lines, and a great many hundred services are in, but the people are not using the artificial gas. Would it not be more profitable to all concerned to secure these consumers than to continually go after those off the lines entirely? Our plan of work for 1912 is going to be largely upon getting business on these lines.

Solicitors have this ideal: The gas range is all that can be gotten in the home, and wait for inquiries at the office before mentioning other appliances. After the gas range is landed do not overlook the water heater. If they are disposing of a coal range and they have a bathroom in the house, there is certainly room for the water heater. Then the laundry equipments. A 2 or 3-hole laundry stove sells at a very low price and can be placed in the average basement. House piping also should not be overlooked. In your evening strolls look for the oil lamp—that is a gas prospect; and, with the uncertainty of electric current, gas should be installed by all means. If the architect has overlooked the gas question, take it up with the owner at once and explain the necessity of gas not only for light, but fuel, not overlooking the grate openings, for the gas grate or gas log has proven a very successful gas earner.

Our solicitors are instructed to make return calls after a range or any other appliance is installed, to make inquiry if the appliances are working perfectly, and I assure you this is appreciated by the consumers, as they believe you are extending them the best service possible. A thorough knowledge of appliances handled in a gas office is an asset to the salesman. Be sure you are thoroughly conversant with the appliance before recommending it to the consumer.

We have meetings of our fitters to explain every detail regarding the selling and adjusting of all appliances, whether range, water heater or lights; and we very seldom have a call where the appliance is not adjusted properly. It is absolutely imperative that fitters acquaint themselves with all adjustments. We should not take it for granted that this appliances are set properly or perfectly adjusted. A sale without service is not a sale. All we can dispose of is service, and a call from a manager, visiting housekeeper, or solicitor is very important. If some of us received the service in any mercantile business that is given some customers who visit certain gas offices, it is a fact we would change our trading place; but unfortunately, with one exception, the gas customer is obliged to deal with us, and as our product is service and our success is service, the prospect that visits the gas office is surely entitled to the best we can give him, and the community at large should be invited to our offices. Do not permit them to think that the gas office is only a place to receive their gas bills and to make complaints. Educate them along different lines, arrange your offices so, inviting and convenient, that the ladies will call and feel perfectly at liberty in so doing. Your office is for your consumers, so make it a place for them. Change the arrangement of your office each week, and do not by any means let it remain under same conditions during two discount periods. All it requires is ambition to do things, and doing is producing.

We really gave a miniature gas exhibit during the month of December, showing numerous appliances and giving continual demonstration. Our windows were so effectively arranged that the local papers gave us a great deal of publicity, and our visitors were numerous not only in the day time, but also in the evening. We profited well by this exhibit, placing December (usually one of the dull

months) in the fore rank of the busy ones, our total appliance business going over $4,200. This amount was from the sale of gas domes, gas portables, ranges and gas heaters, kitchen heaters and lights.

Successful Demonstrations.—What is a successful demonstration? Some say, "The art of cooking and lecture upon kitchen economy." The writer of this paper most enthusiastically differs, and if you are giving demonstrations, inject commercialism into the talks and make it a practical demonstration. You will reap results during the week of the demonstration, while, if it is carried on by some teacher or lecturer of domestic science on kitchen economy, your sales fall below the average of the past weeks. Do you know why they do?

You have elaborated upon the presence of the educator of domestic science, etc., who will prepare and serve a most inticing, elaborate menu, and you no doubt who have these demonstrations, have seen the preparation of a great many fancy, high-priced, dishes that it would be impossible for the average housewife to prepare, and your audience is composed of 97 per cent. gas range users, either housewife or maid, who have come to hear the cookery talks given by the demonstrator. Does the average gas-consuming, range-using housewife stop and go into the chemistry of food stuff before preparing a meal. I should say, no; for, if such were the case, many a good substantial meal would go without preparation. I am not disparaging the teacher of domestic science. I am going to try to tell you that a practical demonstration cannot be carried on successfully by such a teacher.

The demonstrations that get the business are the ones that touch the consumers just where they live and show the prospective consumer the great mistake in not using a gas range. We had 11 weeks of demonstration work last year, and had an attendance of over 20,000 ladies, and many requests by our local managers for more demonstrations. Just an idea of our work: Instead of going to a hall to carry on our demonstrations, we so arranged the sales' floor in the most attractive way possible, showing a complete line of gas appliances, lights, water heaters, gas irons, gas waffle irons, gas griddles and ranges, placing our range, which was always of the cabinet type, in front of our pay window, and arranging other equipment such as kitchen cabinet and tables in the most convenient manner possible, and placing our chairs to seat about 250 people in such a way that each visitor had a splendid view of the work being done. I wish to state right here we have never had a vacant chair at any of our demonstrations.

We provided a week's programme of cake baking, roasting, broiling, bread baking, and filled in with some fancy but simple salads, etc.; dwelling more upon the broiling lessons than any other, broiling some article each day. For your own benefit, we will go into our first day's work:

An introductory talk to the audience on the demonstration work of the gas range, explaining fully that we intend to take up any grievance, whatsoever it might be—high gas bills, improper working of their appliances or unsuccessful attempts in baking, or improper usage of the gas range in any respect, insisting if they have the least semblance of a complaint, now is the time to offer it. A thorough explanation of the construction of the top burners of a gas range, the comparative consumption of same, mode of cleaning burners, how to clean a gas range, the prevention and removal of rust from the oven and body of range, and explicit explanation of placing of bread stuffs in correct place in oven for baking, etc., the economical usage of different burners and the use of oven while broiling.

We are to have cake baking and broiling, and white cake being an ideal one, we shall prepare it according to recipes which will be distributed at once. During the preparation of this cake you have the privilege of asking any questions you care to regarding it which will be gladly explained; and, furthermore, each morning, by engagement, we will gladly give you, should you wish, private instructions upon any article prepared free of charge to you absolutely.

An advantage of this was taken, I assure you, as our audience saw at a glance the affair was quite informal. When the cake was ready for the oven, a short but complete talk was given on the lighting of the oven, time required for heating same and position of oven racks while baking; also, an explanation on successful cake baking.

Asuming that all questioners were satisfied, the following questions were asked:

1. How many ladies present have a gas range?

2. How many have not? And right at this point the selling force is quite busy getting the names of the prospective users, and we always secure our share.

3. How many ladies use the broiler in their gas range? And, gentlemen, you would be greatly surprised if of 200 users of gas ranges in the audience, often 85 per cent. did not use the broiler.

4. May I ask some of the ladies not using the broiler their reasons for not using the same? And these are a few of the many reasons:

Do not know how to broil.
Broiling makes the pan so dirty,
The broiling pan must be scoured; frying is easier.
Broiling pan rusted out.
Tried it, and steak caught fire.
Use the broiling section for toasting; and many, many more.

Explaining that we would broil each afternoon and would give the first broiling lesson at once, going into detail on the usefulness of the broilers for meats, and the abuse of same for toasting, explaining and showing the gas toaster in operation, saving them money on their gas bills and securing much better toast, calling attention to the recipes on broiling and method of preparation, we always asked them to follow and watch preparation and placement of steak in broiler section. The following were the plans: Place steak on wire rack of broiler pan (the pan was passed through audience for inspection, calling their attention to same) and explaining when steak is broiled we will pass it again for the inspection of the ladies claiming the broiler pan becomes so dirty, and assuring them that it will not require 2 minutes' time to clean the same. Oven burners lighted and pan placed in proper section, explaining each operation, telling time required for searing, and after seared again pass it, that they may know what is meant by searing, and why done, then replacing in broiler section for completion of work. During the time of broiling the broiler door is open at different times, showing the audience the different stages of advancement. When a steak is broiled it is again passed for inspection, as well as the broiler pan itself. Steak is then returned to table, placed on platter, seasoned and served, and I assure you there were more broiled steaks in these towns than ever were known of before.

The smaller appliances were demonstrated, such as the gas iron, the gas waffle iron, the gas cake griddle. They were not only shown and explained, but the actual work they would do was demonstrated. In the 11 weeks of demonstration we sold 6 gross of gas irons; and during one discount series in one of our offices, we demonstrated the waffle-iron and sold 5 dozen. Now to give you some sale figures obtained in 4 of our towns during the first week's demonstrations:

One town of	5,600	population,	29	ranges.
"	8,500	"	27	"
"	20,000	"	53	"
"	8,600	"	27	"

And during the period between demonstrations the same active range interest was maintained.

And, gentlemen, you can do the same in your towns, whether they be small or large. Create the interest, give them the service, arrange your office in the most inviting manner possible and be on the job to give them the right hand of welcome. Do not wait for them to ask to be served; beat them to it, and they surely will think you are interested in their welfare. If you are not successful, make room for one who can show results. Business success or failure is contagious.

I do not offer these suggestions for the betterment of your sales department or ask you to take any suggestions for the increase of your 1912 business, but the plans worked successfully for us, being the means of selling over 3,000 ranges. We have placed our star high for 1912, and we will reach the 4,000 mark, I assure you.

The President said they had listened to a most interesting, instructive and beneficial paper, Mr. Kaufman spoke about placing his star high, but he believed most of them knew that he hitched his wagon to a star, and had it there all the time. He could also (if it were necessary) vouch for Mr. Kaufman, for the fact that he had absolutely, along practical lines, done the things reported. It was not a matter of theory, but of calculation that Mr. Kaufman generalized upon. As it was 12 o'clock they would not have time to discuss it for the present. It was then voted to adjourn, until 2 o'clock, the session to be resumed in the Hall of the Eli Lilly Company.

First Day, Afternoon Session.

The Vice-President called the meeting to order pursuant to adjournment, and said: Gentlemen, we have been certainly having many good things handed us to-day. This morning we had Gov.

(*Continued on page* 124.)

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NOTICE TO ADVERTISERS.

New Advertisements and changes of copy therefor should be in hand Wednesday noon of week prior to date of issue.

NEW YORK, MONDAY, FEBRUARY 19, 1912.

[Official Notice.]

Annual Meeting, Illinois Gas Association.

Illinois Gas Association,
Temporary Office of Secretary,
Dixon, Ills., January 17, 1912.

To the Members, Illinois Gas Association: The next annual meeting of the Illinois Gas Association will be held in the Auditorium Hotel, Chicago, under dates of March 20th and 21st, 1912. Announcements as to papers to be discussed will shortly appear in this Journal.

F. E. Newberry, Secretary.

[Special Editorial Correspondence.]

THE FORTY-SECOND MEETING, NEW ENGLAND ASSOCIATION OF GAS ENGINEERS.

Young's Hotel, Boston, Mass., Feb. 14th, 1912.

Dear Journal: The first day's session of the 42d meeting of the New England Association of Gas Engineers was adjourned a few minutes ago, and while its events are still prominent in the mind of your correspondent, this seems the time to get the copy together. To begin with, the "Mother of all Associations of American gas men" to-day celebrated a second coming of-age. Think of it, twice 21! It is a long hark back. However, the staid New England matron seems to lose none of her attractiveness, for the recurrence of her natal days seems to bring increasing numbers of admirers, taking it for granted that by this your correspondent means that the membership rolls lengthen and that the attendance of delegates at the annual reassemblings becomes larger and equally representative as the years go on. Of course, the topic in and about Young's last night was largely the weather of this winter, now and before. Many tales of its severity were narrated within my hearing, and it may be taken for granted that if the thermometer could be counted on to show extremes in other nearby winter seasons corresponding to those of 1911-12, the advocates of 2½ to 3 feet covering for distributing mains would indeed be few—if any. "Clear and cold" truthfully describes the weather conditions; but luckily the atmosphere is not of the windy sort, therefore, we are in comparative comfort. The visitors were out in force, even St. Louis (in the persons of Messrs. Russell and Polk) being personally represented. However, to name the familiar ones from out of New England States, would take up altogether too much space, wherefore I will merely state that the American Gas Institute was ably represented by its Secretary, Mr. Geo. G. Ramsdell. To this I must add that the most notable man present though is that veteran, Mr. H G. Coggeshall, whose yeoman work in Fitchburg (Mass.) gas matters covered scores of years, and whose comparative inactivity to-day is from choice rather than necessity, have scarce added, in physical effect, a blemish to his ways and means of getting about. These bush-beating sentences, though, will not tell your readers of that which was accomplished, so here is the story thereof, told in sequence. The sessions were called to order at 10 A.M., or "nearly so," by that even-tempered man and well-beloved associate, Mr. John A. Coffin, upon whose typical New England physical frame the burden of increasing years has made no marks, and whose mentality is in keeping with his bodily sturdiness. The first number considered was the Report of the Board of Directors, which did not take up much of Secretary Gifford's time (like President Coffin, Secretary Gifford seems to be receiving from dame nature that recognition usually meted out to those who incline to the belief that *festina lente* is a motto well fitted to others than those who claim allegiance to the flag of Italy). The report disclosed the fact that the membership was increasing satisfactorily and that the Association's standing was being constantly improved in every way. The annual address of President Coffin came next in order. It contained nothing of startling sort, but it did reveal something of the quaintness that accompanies pretty near all the sayings and doings of the "Man from Gloucester." This was particularly well exemplified in the paragraph referring to the age which the Association had attained. In fact, he there ventured the thought that the "Mother of them all" would still be vigorous when the Commonwealth had gotten to the point where its Directors would be willing to part at auction with "Plymouth Rock," the monument at "Bunker Hill," and Fanueil Hall. But his words were not all of exultation or of badinage. Briefly and beautifully he recounted the memories of their departed ones, the death roster numbering four, one of whom was charter member F. C. Sherman, another was G. L. Manchester, and a third was that estimable gentleman, F. P. Addicks, whose life was that of a nobleman, whose escutcheon could worthily have carried the phrase *fide et fiducia*. The Secretary's report showed the membership had reached the imposing total of 238, and another of its chapters gracefully acknowledged the gift of Mr. A. B. Slater, who donated to the Association his fine collection of books related to the gas industry for placing in its library. In this connection you will recall that some time ago the Journal noted that, in consideration of his services, Mr. Slater had been elected to Life Membership in the Institute. As Treasurer, Mr. Gifford's figures proved anew that the thrift that follows saving was well instanced in the Association's comfortable balance to credit. The Secretary here had quite some task in even announcing the names of the signers of letters regretting inability to attend the sessions. This brought the regular order to the election of officers, and the balloting resulted in the indorsing of the following executive management for the 43d year, as reported by the Nominating Committee:

President.—D. D. Barnum, Worcester, Mass.
First Vice-President.—T. H. Hintze, Providence, R. I.
Second Vice-President.—C. A. Learned, Meriden, Conn.
Secretary and Treasurer.—N. W. Gifford, East Boston, Mass.
Directors.—H. K. Morrison, H. C. Crafts, J. F. Wing, J. A. Norcross and A. M. Barnes.

The President-elect, in accepting the promotion, made a speech that was thoroughly characteristic of him. Towards the close of his remarks he appealed to his sponsors for their support, without which he would have to record a failure; but that he need have little fear for such lack of aid, assistance and countenance would seem forcibly shown in the tumult of applause that greeted him as he ended his petition. And here came up for consideration a matter that had been given wide publicity at the meeting of the various engineering societies whose headquarters are in Boston. It had its inception early last year, and the matter was thoroughly gone into in the interim. Briefly stated the main thought was, all concurrent parties working ing harmoniously, that it would be feasible to construct in the city an edifice up to housing all the societies or bodies, the edifice to be up to every need in connection with their doings, including library, lecture hall, kitchen and dining rooms, etc. The present status of the thought seemingly rests in the belief that (for the current time at any rate) such a building would involve too great an expenditure. The scheme as modified proposes that the building at No. 2 Commonwealth avenue be purchased, and so reconstructed or remodelled as to afford ample library space and an auditorium up to seating 500 or

more. The scheme also includes the dining room feature outlined in the original proposings. The matter, in so far as the New England Association is concerned, was referred to the joint consideration of the President and the reigning Board of Directors to determine whether the proposition shall be accepted or rejected. During the debate (and after it for that matter) it was quite a frequent thing to hear the expression, that if favorable action were taken it would mean good-bye to Young's. This brought us to the paper list. In that two of the topics listed had much relation to each other, it was determined that "Shaving Scrubbers," by Dr. J. F. Wing, and 'Data on Removal of Tar from Water Gas," by Mr. A. P. Beardsley, be read successively so that a joint discussion could follow. The subject matter had to do chiefly with water gas tars, and Dr. Wing's contribution was notable for the thoroughness with which he went into his subject. Those who know the Doctor, know that he is a great one for detail; but he never detracts from his subject by repetition. Mr. Beardsley's facts, too, showed that his communication had absorbed both much time and close attention in its preparation. The discussion that followed was well worth while. The paper by Mr. V. E. Bird, on "Recent Developments in the Manufacture of Water Gas," was also meaty enough to cause an animated debate. In fact, so interested were the participants that it was not at end when the luncheon hour was reached, and rather than cut it short, the cross-questioning was concluded.

After the luncheon had been disposed of, the first regular number for the afternoon sitting was a graphic narrative of what had been done in New Haven harbor along the lines of "Submerged Gas Mains." The author was Mr. H. E. White, of New Haven, and the value of his recountings was well increased by the judicious reproduction on the screen of various slides showing many section and cross section examples of this arduous work in the various stages (or "floats") of construction. The last paper for the day was that by Mr. Palmer York, on "The Office as a Publicity Medium." It was read by Mr. C. E. Paige, of Malden (the author was unable to be present in person), and the discussion on it was rather restricted. During its reading, however, your correspondent could not help wondering how some of the things put forth in this connection as assured facts (and such they certainly were) would have been received at a meeting of the Association held say in the middle seventies.—C.

SAME DATE, BUT LATER.

Dear JOURNAL: The banquet, which was served this evening as a guarantee of the hospitality and brotherhood of New England's gas men, differed in no great respect from any of its 41 predecessors. Only goodwill; honest expression of thought; fraternity in the fullest sense thereof, characterized it. That there was good food, well served, needs not repeating, since the tables were set in Young's; but perhaps I was a trifle too fast in saying that this meeting differed not much from its predecessors in many respects. And I believe I am not far wrong in declaring that the speechmaking section was of an exceedingly fine order this year. Of course, President Coffin made an excellent toastmaster—and right here let me say that President Coffin said in 1911 that the dinner for 1912 would be a memorable one, and he certainly made good his prophesy—and the speaker of the evening was General Hugh Bancroft, Chairman of the Board of Port Control. Of course, we have some seaport in this section of the country, but if the General's words come true, why even our cherished Montauk Point (L. I.) debarkation schemes for ocean liners will be a puny thing. However, time will tell. When I note that the "also spoke" included Capt. McKay, C. F. Prichard, D. D. Barnum, C. H. Dickey, W. G. Africa, and A. A. Brown, you will agree with me that interest was maintained to the last dregs. Notable, too, amongst the diners was the veteran Coggeshall, who surely has gone the route. The feasting and merrymaking ended at a seasonable hour, and the pleasures of the assembly were shared by 125 or more. It is thought that the business sessions will be concluded at an early hour tomorrow afternoon.—C.

YOUNG'S, BOSTON, Feb. 15.

Dear JOURNAL: The second day's session was "prorogued" at 10:30 A.M., and the first thing considered was the paper on "High Pressure Distribution," prepared by Mr. C. G. Goeltz. The title *per se* is rather misleading, in that it dealt with the construction of the Old Colony Gas Company's new plant at Weymouth, which work was completed in the short stretch of 6 months. Weymouth is the center of the distribution web, the outer thread of which is perhaps at some places 15 miles in diameter, and through center—that is, between longest points—reaches perhaps 12 miles. In all, at any rate, the high pressure carriers figure out 56 miles. The paper brought out a good discussion, and its main features are sufficiently interesting to cause many a gas man, having knowledge of certain points instanced, such as Weymouth was and is, to go into such points with the object of supplying gas thereto. The second number was descriptive of the "Gas White Way in New Haven," written by Mr. J. Arnold Norcross, of the New Haven Company. This was an extra number, and it was a most interesting one. The preciseness of Mr. Norcross was never shown to better advantage than in this instance. Concise, clear, unimpassioned, his history of the case, and the narrative of its development, will beyond a doubt do great work in attracting the attention of other Eastern municipalities to follow New Haven's lead. The final number had to do with "Industrial Gas Appliances," by Mr. H. C. Barnes, of Hartford, Conn. Unfortunately, Mr. Barnes was unable to attend the sessions, so to Mr. H. K. Morrison fell the task of reading it. It was brimful of interest, and it is regrettable that the author's absence necessarily curtailed the discussion. And so ended the 42d sessions of the New England gas men, and a peculiarity of this one was the remarkable attendance during the technical times. That the interest was maintained to the end is best attested when I say that 94 were present when the President announced the swan song. Take it all-in-all, the meetings directed by our own John Coffin will long bear testimony to the magnetism of his personality.—C.

BRIEFLY TOLD.

CO-OPERATION IN ASSOCIATION WORK.—Mr. George G. Ramsdell, Secretary of the American Gas Institute, writing under date of the 15th inst., says: The editorial (issue for Feb. 12th, p. 106) on "Co-operation in Association Work," is both timely and to the point. The true co-operation with the Institute should be by affiliation, and we are hoping to bring about a plan (that will be mutually satisfactory) intended to cause affiliation to take on a broader scope than it has thus far assumed. When the details are fully determined, it will be taken up with all the State and district Associations, and we hope for beneficial results.

INSTITUTE PIPE STANDARDS VOLUME.—We acknowledge the receipt of a set of "Inko-Grafs," at the instance of the courtesy of the officers of the American Gas Institute, beautifully outlining in detail the standards for cast iron pipe and specials, as adopted by the Institute at its meeting in St. Louis last October. The symposium is really a collection of plates, 9½ inches by 15 inches, beautifully printed and handsomely bound. The size and form are convenient, so they should prove doubly useful in the record-collections of everyone interested in gas engineering. As the Institute (party of the first part) and the pipe manufacturers (parties of the second part) have agreed upon the prescribed dimensions and measurements, it looks to be only a question of time required to prepare patterns, and the like, for the establishing of a uniform system that cannot help greatly benefiting both "partys." The exceeding importance of the subject is attested in the fact that the work has required years for its completion, during which times it has been given careful and painstaking labor by committee representatives from The Society of Gas Lighting, the American Gas Light Association and the latter's successor, The American Gas Institute. It is not saying a whit too much when it is said that a copy of these standards should be in the library of every gas engineer who deals with American pipe founders.

CHANGES IN EXECUTIVES, PENNSYLVANIA GAS ASSOCIATION.—At a recent meeting of the Council of the Pennsylvania Gas Association, the resignation of its President (Mr. C. W. Butterworth) and its Secretary (Mr. Wm. H. Merritt) were regretfully accepted. No other course was open to the Council, in that business changes, involving greater responsibilities obliged the officials named to remove from the Keystone State. The gentlemen elected in their stead are: President, William R. Rhoades, Williamsport; Secretary, W. O. Lamson, Jr., West Chester. Pretty good selections, these; and the prompt acceptance by the gentlemen goes to show the spirit that animates the Pennsylvanians. Pick up the lines whenever the latter fall, without cavil, without question, and stretch them taut. On the other hand the gentlemen who retire leave their desks in such shape that their successors have only to go forward. Details of the meeting will go next week.

CURRENT MENTION—

MR. R. A. SANBORN, formerly with the General Gas Light Company, Kalamazoo, Mich., has been appointed Eastern Representative of the Sprague Meter Company, with headquarters in Bridgeport, Conn.

THE Ohio Gas Association managed to keep its doings in Columbus, on the occasion of its first meeting (the second week in this month) pretty well covered. However, 50 representatives of the artificial and natural gas interests in the State were present. An address of welcome was spoken by Governor Harman, and another speaker was Mr. O. P. Gothlin, of the Public Service Commission. The main thing accomplished seems to have been the estabishment of an Information Bureau, with headquarters in Columbus, intended to keep the members fully posted as to the rulings of the Public Service Commission, the proceedings of the Tax Commission, and the doings of the Legislature.

(*Continued from p. 121.*)

Marshall, and we have Prof. Parr this afternoon. I shall not take up time telling you about him, for you all know who he is. I am very glad to introduce to you Professor Parr.

The Professor thereupon made the following

ADDRESS ON CALORIMETRY.

Mr. President and Members of the Association: I feel a little timid in coming before a lot of men who know the gas business from the practical standpoint, which I do not. I think I should confess that at the outset. If I have done some work along the scientific side, it is only another indication that the scientific men and the practical men should get together more frequently to compare notes, for each can help the other.

To my mind the interests that center in the gas business are paramount in the industrial world to-day. Twenty-five years ago Mr. Siemens said—you are familiar with the quotation, no doubt—"It is positively barbarous to burn coal in the raw state;" still we have been going on burning coal in that state and making smoke and fouling the air with smoke and getting poor and lean efficiency out of it. Twenty-five years from now the state of the case will be very largely changed. While there has been good progress in the last 25 years, I anticipate that more will be made in the next 25 years. I think I am justified in this proposition for the reason that the year 1911 must serve, it seems to me, a sort of changing point in the proposition, because in that year there were delivered, and I think this is a fair index for my statement, three addresses of a chemical sort which would be notable in any year, but especially notable in their relation to the gas business. One of those addresses, to my mind, will stand as the greatest chemical address of the year, if not for many years, no mat ter whether you relate it to the gas business alone or to any chemical subject. These three addresses were all of this sort. The last one (perhaps the one that will appeal to you least) was by Prof. Lewes, the great English investigator of gas and coke manufacture. It details his study of the conditions and elements in coal which are responsible for gas, as we want it, and for coke as we would like to have it. It comes nearer assembling his own knowledge and that of other experimenters to give us an idea as to what the manufacture of coke really is than anything else that has been published.

The next address I refer to was delivered in the summer, by Sir William Ramsey. His work has been on the raw elements, and as President, of the British Association for the Advancement of Science, in his address, he dealt primarily with the idea that the coal resources of Britain were limited and that if the supremacy of the British Nation was to continue the coal supply must be conserved, because without coal there could be no Great Britain. He went on to say that the use of coal in the raw state, which Siemens said was positively barbarous, required 4 to 4½ pounds of coal to develop a horse power-hour, and that we must do better than that, or the British people must do better, if they were to continue life as a nation. It certainly is a startling thing to know that, at the present rate of consumption of coal in Great Britain to day, 170 years will be the life of their coal supply. Whether the present rate will continue until that time, of course, no one believes, but it is time for them to take an account of stock and scrutinize very carefully the methods that must be looked after in conserving the coal supply. So he says that, from the crude coal in the ordinary engine, requiring 4 to 4½ pounds for 1 horse power-hour, to the adoption of the turbine engine, where it has been cut in half, is a great advance. He goes on to say that a still further marked advance is possible in the utilization of the fuel value in the gas engine, whereby 1 to 1½ pounds of coal represented in the form of gas will do the same work. Now, we do not need to follow in detail his argument, yet it is very plain to see that, if you can multiply the value of 1 pound by 4, you can multiply the length of time that the coal fields will be available by 4, and by these measures the coal supplies must be conserved. So that you see really his address was an address along the lines of gas manufacture.

The third address I have in mind is one with which the gas men are probably more familiar, and that is the address of Dr. William Bone, before the American Gas Institute, at St. Louis, and repeated once other than that time, in New York on his way home. This related to the matter of surface combustion, and we will discuss that a little bit more fully later.

It is in the line of Ramsey's address, in that if a given heat quantity can be made to do another doubling of work, why, then, we have gone on and multiplied our original amount of coal in the raw state by 2, then by 2, and again by 2, practically.

Now, we cannot go into these details, but I wish to take up a phase of the gas business, which is only one of many that might be taken up along this line to show that more and more of gas business, as in any business that has to do with the fuel supply, is coming to be placed upon a scientific basis; and the scientific basis means simply that we know what we are doing. Science is sometimes defined as classified knowledge, which simply means that, instead of going at a thing in a cut-and-dried way, or doing things because they have always been done that way, without question whether the best way or not, we are coming to turn more and more to a basis where we can put our operations upon units of reference of this, that, and the other sort, so that we know from time-to-time, by comparing with a unit of some sort, what we are doing. I suppose we owe a good deal to the electrical people. They have been doing some things a little better than we have perhaps; and that is one of them, in that they must know what their units are, what their unit output is, and what the unit cost is. It is a vague sort of thing and they cannot see or get hold of it, or breathe or handle or smell the fluid they make, so it has been necessary for them from the very start to know their units, to measure them, to get at the cost in order to made ends meet and bring the balance sheet out right. Something of this sort of a revolution, I may say, is going on in the gas industry. You probably know more about that than I do. The original unit of reference, so far as the gas manufacturer was concerned, of course, was the candle power unit. Gas was originally made (and we are about to celebrate the 100th anniversary of the gas business) simply for its candle effect. A great deal of time and money and energy has been spent on knowing what the candle power is, which was all very well when gas was of the simple type, and made in the same way, and burned for its illuminating effect as a luminous flame; but with the multiplication of the types of gas and with the multiplying of the uses and the almost total abandonment of the luminous flame, the candle power unit is a thing of the past. That is, it would be a thing of the past if the public knew as much about the gas business as the gas manufacturer does. I suppose we will have to wait on the public a little while before we are able to entirely abandon the candle power unit. They probably will travel along hand-in-hand for a while with the other, until that which I wish to speak of at this time occurs primarily, and that is the heat unit for the measurement of quality and standard. I do not know that I need go into discussion as to why the candle power and the heat unit do not agree, or do not go hand in-hand. If they did, if they were so accomodating as that, then our problem would be considerably simplified. Ordinarily we would suppose that the more candle power we had the more heat value we would have. If that were true, then the candle power would be all we would need, because it would be a relative measure of the heat value; but it is not difficult to find illustrations. Take marsh gas, for example, which has a very high heat value but a very low candle power. Now, this tends to mix up the ratio, which we wish were constant. So that sometimes we will come along with a gas of a certain composition which will have a low candle power but a very high heat value. The point, then, before us is "Shall we adopt or shall we make use of, or what is the use of the heat unit basis for our product?" Well, the consumer may not know it, but in the cook stove what the consumer wants is heat, not light. The consumer may not know it in the gas mantle, but what is wanted there is a gas which will make heat, because it is the heat generated in contact with the filament which makes the light, so that we will get more light out of a high heat value than we will out of a low one. Again, the operator himself ought to know what he is putting out, for the reason, that under certain conditions, if he is putting out a gas which is lean and poor, it is just as much to his interest, I venture to say, to know that fact, it should concern him just as much, and in the long run will concern him just as much as the consumer, because there is going to be sometime a recognition of the fact that what is good for one is good for the other. Again, if he is putting out more heat units than is necessary, it is important for him to know it. The fact of the matter is that, as a gauge of his work, the heat unit value that he is putting out is a better medium for determining that fact than anything else. Far better than the candle power.

Now, just a word about what standards are being called for in this country. I think there is only one city in the United States (Galveston, I believe) that has an ordinance permitting the use of gas of a lower heat value than 600 B.T.U.'s per cubic foot. I think there are a few cities that require 650 B.T.U.'s, but the great majority of them, so far as they have any standard at all, require 600 B.T.U.'s per foot. This is a little higher than is required in the old country. I think

many cities (Berlin, in Germany, for example) have a requirement as low as 450 units. I am not sure what the value is, but I think it is 450 units, and 550 is perhaps more common in Europe than in this country. But this does not mean anything especially, excepting that they are not accessible to as rich coal fields, or as rich gas producing fields, or as easily portable materials as we are. We are prolific in the possibility of gas manufacture. When you consider the availability of oil and oil gas in connection with that matter, you realize it. I only refer to that as an item in passing.

In regard to methods of measurement, and that perhaps is one of the things in which we are largely interested this afternoon, the types of instrument that may be made use of for measuring heat value of gas. I could hardly stop to refer to the flame. The length of a flame or the noise that a flame makes, or some of those rough-and-ready processes that seem to be well enough as general indicators, are absolutely unreliable and misleading, and come far short of the requirements, where anything like accuracy is desired. For example, if the limit of accuracy is 1-11/23 per cent., why then an instrument that is accurate only within 25 or 30 per cent.? We would hardly be justified in using it. The common type of calorimeter with which we are mostly familiar is of the Junker type, with which you are probably more or less familiar. Now, it involves the metering of a rather large volume of gas, in the first place, and the burning of that gas over cooling surfaces, with a sufficient volume of air to carry on the combustion, and enough excess to make sure that you have a perfect combustion: that is, we must have perfect combustion of the gas and a probable metering. I do not wish to be understood as criticising the Junker calorimeter, but to bring out the points of difficulty that are met with in that instrument. In the first place, the metering of the gas by mechanical means is a rather difficult matter. The meters that are ordinarily met with are apt to be in error 2 to 3 or even 4 per cent., and it is necessary, of course, to calibrate a meter that is in error to that extent and make correction for it. That can be overcome largely by a better grade of meter. Meters are made and are on the market which will give us a far more correct measurement of the gas actually used; and still a variation in speed always induces an error in the meter. Then, barometric pressures are to be taken into account. So that the meter itself has quite a task in hand to give us a correct measure of the amount of gas we are using. You may say that the meter will have no greater error than the gas when used; that is, the metering of the gas as we sell it, the metering at the works all contain error. Of course, but if the instrument meter is a minus error and your other meters are plus errors, you are getting far apart. Again, it is not so much the fact that you want to get a comparative value of the gas you are using, but for purposes of basing calculations, the only thing is to get as nearly as possible the absolute value of the gas. Now, when it comes to the extraction of the heat there are a good many difficulties involved in the burning of a gas which has a large per cent. of hydrogen, the products being water vapor, of course, and this, spreading over a cooling surface, condenses and gives us a wet surface for extracting the heat. Now, if we could burn our calorimeter inside out.

You see, we put on a jacket and insulate as well as we can, but the interior of the calorimeter is moist and the constant carrying away of the moisture lowers the temperature of the instrument and our readings are a little low. So that there are difficulties in the matter of the moisture contained on the measuring filament on the interior surface of the calorimeter, which is another of the difficulties that that type of instrument has to work against.

Now, whether we have eliminated those difficulties in the instrument we have here this afternoon may be a question. At the same time, the effort has been made at least to eliminate those two types of difficulties, the matter of metering the gas, including the barometric error variation and things of that sort, and the matter of radiation or carrying away of heat by vaporization of the moisture which results from condensation of the gas. The principle involved is as follows, and if we proceed along this principle we will burn two gases side-by-side in a dual instrument, and in one of these instruments, if we may so look at it at the present time, we have a standard gas of known value and constant purity. Then we can compare our unknown gas with that standard gas under conditions which will eliminate matters of metering and radiation. That is to say, we have here a volume of gas contained in a cylinder submerged in water and another volume of gas in a cylinder submerged in the same water, and they have a water pressure with a head which is equal, have this pressure of water running from the same head, the same elevation, and pressing down those two v olumes of gas which are submerged in the same vessel of water. What do we have? We have two equal volumes of gas under the same pressure and the same temperature. If we turn the two volumes out together, and one of them is known, then the other gas bears a direct proportion to that gas in its heat value. Now, it does not make any difference how much we burn, so we burn the same amounts, you will notice. If our gasholders are exactly equal in volume then it does not make any difference whether we burn a cubic foot or one-tenth cubic foot. It does not make any difference what the barometer is, because if we take the value of a standard gas at the standard barometer, that we are going to refer to, 30 inches at a temperature of 65°, then the comparative value we get with that will be directly the value of our unknown gas at 60° and 30 inches of mercury. If we want to refer to any other standard of pressure and temperature, then it would be only necessary to take that value for our standard gas. So that, by using equal volumes at equal temperatures and equal pressures, we eliminate the variations due to barometer and due to the mechanical metering of the gas. Now, if I have made that part of the principle clear, let us go to the next point, that of radiation. And if some of these things are not clear when we go over them this time, we will see when we go through a little bit of the manipulation how it operates. The other point we wish to establish is that the matter of radiation (or vaporizing) of water, or the change in heat values that may occur in the burning of the gas that we are testing, may be eliminated in the same way; for the reason that, suppose our standard gas is being burned on one side, and say this is our testing gas on the other side, we will lose something by radiation, even though the apparatus may be jacketed. But do you not see that if we lose a little by radiation here we lose the same factor here, so that the matter of loss by radiation is equalized, or self-corrected, for the reason that we have run the two under conditions which will permit of the same amount of loss in each gas, so that the ratio of values is not affected. Now, then, you will say still, suppose this side only generates 2° of heat and the other side 4, the radiation from 4° will be twice as much as it will from 2°. Very well; now that is corrected in this way: It so happens that the standard gas we will run on this side is hydrogen. It so happens that the ease with which we can get pure hydrogen is rather interesting, and we can get pure hydrogen as our standard. Now, what is the value of hydrogen per cubic foot? Well, 325 units; 325 units, then, would be the heat developed by the hydrogen. What is the standard we are going to attempt? It is likely to be nearly the quality of city gas. Well, it is from 600 to 650, somewhere along there; 650 units is probably more frequently the output than anything else. On one side we are burning hydrogen, and you will see the radiation error is not corrected, because we have twice as much radiation on one side as we have on the other. That is true; but suppose we burn twice as much hydrogen on this side as that? We will burn the quantity of hydrogen which corresponds to 650 units. That is what we do. We have a third tank—you cannot see it—immediately back of this one, with a cross connection in such a way that we can burn 2 volumes of hydrogen against 1 volume of city gas. In that way we have discharged pretty nearly the same amount of heat under the two systems, and by so doing we have eliminated the error, which is due to radiation. The two things then which are the greatest source of difficulty, the metering of the gas and the loss by radiation, would be overcome by these elements that I have referred to. Now, a little bit more of detail perhaps is desirable. The water pressure here puts the gas under pressure and the burners operate in a chamber about up here, and these are the valves that open them. Now, it is necessary that the water content of these heaters be exactly the same in the two cases. The thermometers are read at the start and at the finish, and if one flame here would give a rise of 2°, and one flame here would give a rise of 4°, then this gas is just twice as good as that. I am just using that as an illustration. Or, if we had 3° rise here and 4° rise there, then this gas is 4:3, or this gas is ¾ the value of that; or, to turn it around, if we had 10° rise here and 5° here, this gas would be half as good as this. You see the calculation is exceedingly simple and takes no account of the barometer or of the humidity of the air, or anything of that sort. If we could have the lantern for just a moment I would like to show you how the internal structure of the apparatus works, so far as the method of extracting the heat is concerned. [Showing pictures.]

We have just been looking at a cross-section of this part of the instrument. The condensation chamber comes up inside, as you see; here one burner is about at that point. The heated gases go up and are cooled, then they come out and are distributed in openings that are round ½-inch tubes that are all around the base here. The ther-

mometer goes into the water in such a way that the circulating water passes it. As soon as all parts of the mass are stirred then we have the temperature actually given. We have a stirrer in each one which revolves at the same speed, has the same belt and the same motor, so that they are subject to exactly the same influence on each side as well as being arranged to measure automatically exactly the same quantity of water, so that if the heat discharged is subject to the same conditions, the same weight of metal and of water, and the same speed of stirrer, any errors that may be due to variations of that sort are eliminated.

Now, the next item of interest perhaps will be the generator for the standard gas. I would like to show you this. [Pictures shown.]

The generator for hydrogen, for the standard gas, is in this instrument here. And since it is charged with material, we can see its construction more readily by looking at the cut. The hydrogen cock, you see, is open, is already in operation and is always in operation ready to automatically deliver the hydrogen. [Pictures shown.]

We have a gas tank full of hydrogen in here; that is, it occupies the space in the middle. It has been generating hydrogen until it has blown the water out mostly and the water now stands at this height. Now, if we want to fill our tank with hydrogen on this side and with gas on the the other side, all we have to do is to lower our gas head. Now, I don't suppose you can see the movement of the levels here, but this tank is connected with the city gas supply. Here is the level of the water. It goes down, you will see, to a point where it begins to go rather suddenly, for the reason that our gas tank has been narrowed down to 1 inch so that we can measure the cross section of an inch very readily, instead of trying to measure it up above, where the cross-section is large. Now, we might have been running our hydrogen gas in the same way, but you see the hydrogen level is running down here. We have the water pressure here, so that our hydrogen is running in in the same way. It perhaps goes just a little bit slower than the other side, for the reason that we are filling two volumes on this side, whereas we are filling only one volume on the other. Now, the pressure of the water brings our water levels back in sight again and they are constant right here. Sometimes we put just a little bit of coloring matter in the liquids, which makes them more easily seen at a distance. Now, we see at once that they are exactly on a level, and if they were not, we would let a little bit out of one side or the other until we brought them to a level. So that we will start even at this end of the operation. Now, if we burn the gases that we have measured—I have turned these little pilot lights up so that you can see them—they turn up in such a way that they happen to strike immediately in the tip, which is just like that of an acetylene burner, as you see. Now, I haven't turned on the gas yet. This thermometer is graduated to twentieths of a degree F., and can be easily read at hundredths of a degree F. Now, after having taken our readings we have the two burners going and the liquid rising in the two sides. We are running this a little bit faster than that, but no special matter about that. Of course it is impossible for you to see the jets, but afterwards if you care to see them you can. You are familiar with the two points of an acetylene burner that strike in this way, I suppose. That is for the purpose of making a simultaneous combustion in an acetylene flame; but if we do the same thing with city gas we will get not only a perfect combustion, but we will get a non-luminous flame just like a Bunsen flame, for the reason that there is no light given off by the flame at all. It is a blue flame. Of course the hydrogen has no light either. Now, it will take to burn out the 2 flames of gas 7 or 8 minutes. I don't know that we need take the time for burning them out. The equalization of the heat should be perfect. Perhaps I had better speed them up a little bit, though there is no special distress about it. I think you can hear one of them blowing just a little bit. It is probably burning a little faster than it should when it blows in that fashion. Now, since they are pretty nearly burned out, we might as well let them go on. When the large volume of the gas reaches a narrow point, like the neck of a flask, it, of course, is easily measured, and it is at that point that we will wish to shut it off. I do not know whether you can see the level of this column or not. Now, I have shut it off at that point. It will be necessary for us to run this to the same point, because we started at the same level below, and in so doing we will have burned exactly equal volumes of gas. I do not suppose you can see the water levels, but they have stopped at this point. In other words, we have measured both flames at the constricted part of the vessel and they are exact as to quantity; or, rather, they are exact in that this has burned 2 volumes against 1 volume of that. If we take our readings on the thermometers we find ordinarily, for example, that we had a rising temperature on the one side of 2.25 and on the other side of 2.35, or about as much of a variation as we would ordinarily get in gas of standard value. If we had had 2.25 on this side and 2.35 on this side, then this is a trifle better than 2 volumes of hydrogen; that is, if the hydrogen is 650, the house gas is as much better than 2.35 times 650 over 2.25. That would be all the calculation necessary to give you the value of the city gas at standard pressure and temperature: $650 \times 2.35 \div 2.25$ would be the heat value of the city gas.

Now, I have occupied more time than I intended to for this particular phase of the work. I think I will stop at this point, so far as this part of the topic is concerned, and answer any questions you may wish to ask. I don't know that there are any other points which need to be demonstrated or not. The cycle perhaps might be completed by saying that if we want to start for another test we simply open the cocks. We are now filling with a fresh supply. It has taken 9 minutes to burn out the gas. It takes perhaps 5 or 6 minutes to fill them up again and take the reading of the thermometers, and perhaps another 5 or 6 minutes at the other end, so that 25 or 30 minutes would be ample to complete the cycle, as far as the time is concerned. If we are working on gas from the outlying districts (a mile or two) the question might arise, "Would you like to take the instrument 2 miles out to the edge of town," or how shall we get the flow of gas out at some distance where condensations and other changes have taken place? The matter, it seems to me, is simplified over the matter of taking an instrument around, in that a gallon vessel of the gas brought to the instrument is far simpler, and that quantity of gas would give you 2 or 3 readings, since the holder only calls for about 1½ liter, a little over 3 pints, we will say, of gas, so that a relatively small holder brought to the instrument will give us all the necessary means for determining gas at a distance, or if the gas from another city is sent in. The particular thing in shipping gas is to have a tight container; but, granted that you can ship gas in a container that will bring the gas intact without leakage, it is an exceedingly simple matter, instead of running in the gas from the main, to attach the hose to the container. Now, of course, you might say there is a chance for leakage there, of taking in a little bit of air along with it. I think I can show you that that is a simple matter, because when we drive out the last gas we have been using, and keep this cock open until water begins to flow here, or until water begins to flow out of a short bit of hose, we certainly have excluded all the old gas. Then, if we slip the container capillary into that, we have certainly eliminated all the chance of air or other gas in this end, and by opening the fresh gas under a little bit of pressure, we have eliminated any mixture there. So that we have an absolute connection with the pure gas, or with the gas we are wanting to test. Now, any of you who have the old type of calorimeter on a new type of gas, know that it must be run for ½ hour to 1½ hours to sweep all the old gas out before it is safe to take a reading. We could just as well hook on here a gas from another city and fill it, knowing that we would be absolutely free from the old gas as we would be if we were taking in another supply of the same gas, so that we have refilled our vessels and are ready, after taking the readings, to start over again.

Now, Mr. President, that is all I care to say on the topic of the calorimetry of the gases. I believe I had promised to say a little bit about surface combustion, but I thought we had better get through with one point before we took up another.

Discussion.

A Member—Have you compared this calorimeter and the Junker instrument, to get the comparative value of the gas with the two calorimeters?

Prof. Parr—Perhaps I might refer you to an article printed in the "Journal of the American Chemical Society," which gives a full detail of such a series. The date of that was August 10th 1911. In the first place, we ran a Junker on the city gas, drawing on the same main into the Junker and into this instrument. We also ran the Junker instrument perhaps a month altogether on hydrogen generated in quantities sufficient to keep the instrument running at normal rate, metering the hydrogen through a special meter purchased from the American Meter Company and had standardized carefully. Now, following the prescribed conditions as to the exit temperature of the gas and the beginning temperature, the value given for hydrogen by the Junker calorimeter was about 312. That, however, could be brought up to the standard value for the hydrogen by varying the temperatures. That is, running the outlet gas at a lower temperature than the room, so as to reduce the chance for radiation until a

point was reached where the value of the hydrogen was 325. Now, if we ran the exit gas out at about 10° lower than the temperature of the room, the reading of the Junker instrument agreed with the accepted value of the hydrogen. When we came to run that side-by-side on the house gas they would check exactly when we followed the same procedure; but when we followed the procedure prescribed of running the exit gas from the Junker at the same temperature as the room, then our values for the Junker were from 11 to 15 units lower (3 or 4 per cent.) than the readings of this instrument. Whether we would say that this instrument was in error and gave 3 or 4 per cent. too high values all the time, or whether the Junker was in error and gave too low readings, I don't know that we have enough data perhaps to say; but from our experience we were very thoroughly convinced that this was a very good instrument to check the Junker by and find out its degree of accuracy, and I think the principles enunciated, so far as the elimination of error goes, or so far as the self-correction of error is concerned, would be an argument in that direction. Of course, that may be a matter of individual judgment, and I perhaps ought not to go into it in detail, for the reason that my judgment in the matter might be *ex parte*, or prejudiced, or some thing of that sort. But that was the outcome of our test, at least.

Mr. Thwing asked if in using this instrument the hydrogen was assumed at its gross heat value?

Prof. Parr replied, yes, the gross value, without attempting to take out the water of combustion, on the theory that no instrument collected all the water. He did not know whether any gas engine people were present. They were the only ones who stickled for the net value of gas. They did not do it with coal.

Mr. Thwing said a good deal of academic controversy on this subject was extant, particularly in getting heat values in city gases, as to whether the gross or net value should be taken.

Mr. A. B. Davis (Indianapolis) said that for the past 4 or 5 years it had fallen to his lot to work almost daily with calorimeters, and to install a number of calorimeters for various gas companies over the State. He always recommended the Junker calorimeter, because it was the one with which the least fault, he believed, was found by the American Gas Institute, and also because it was a very efficient instrument as a general rule, and was not a difficult instrument to learn to operate. He, however, realized that the Junker had many imperfections or imperfections caused through neglect to take due precautions. He always recommended the Junker since he believed no other calorimeter on the market equalled it at the time. In the last 6 months, he learned that the Parr instrument was on the market, and the first time he had seen this instrument, was, when unpacked that morning. He asked Dr. Parr a good many questions, for if it had any faults he would like to know about them at the outset. The result was the more fault he tried to discover the more he failed to so do. With the Junker instrument, where they had to measure the volume of gas, they all knew the trouble with meters, and Dr. Parr avoided such use by taking gas immersed in a tank of water under a constant pressure, wherefore he got a definite volume under a definite pressure. The very principle of the instrument avoids the necessity of correcting your final result for barometer and temperature, which is a great source of error in the Junker instrument. With the Junker instrument, too, the temperature of the inlet water and outlet gas had to be taken into consideration. The Committee appointed by the American Gas Institute recommended that the inlet gas, the inlet water and outlet gas be as near room temperature as possible. According to the pamphlet issued the company manufacturing the Parr calorimeter, almost positive proof seemed shown—and he did not know of any physicist or chemist who had been able to dispute them—had proved that the Junker calorimeter was as much as 4½ per cent. low when worked by the method prescribed by the American Gas Institute; also, burning the gas in comparison with hydrogen of an absolute standard, using the hydrogen as the basis for the calculation cutting out almost any calculation at all. Any of those present who had used the Junker or flow-tight calori meter, of course, remembered the calculation necessary after one had finished. In fact the calculating took almost as long to make as it did to run the test. There were so many things to correct, and after that one still had made no allowance for humidity. In the Parr calorimeter there is no need for humidity correction. He felt that the Parr calorimeter was eminently a referee's instrument. He had seen a list of some 25 or 30 standard lamps to measure gas by. The sperm candle never was accurate, and there had been much money spent in getting a standard of light by which to measure gas. Another point was, if they made the Parr calorimeter a referee's instrument, would not that avoid all this trouble, since a determination of heat units made on the Parr would almost have to be accepted by the courts as a standard in that it was almost above question. There was scarcely a question that could be raised against a determination on an instrument of such type; at least, some of their best physicists and chemists had tried it; and, so far as he knew, they failed. [Applause.]

Mr. B. H. Danforth (Fort Wayne) asked Prof. Parr if he had ever tried it with any other gas than the ordinary city sort.

The Professor said that for probably a year they carried on tests in the effort to use ethylene. In this two difficulties were involved. First the difficulty of making a material that was beyond question pure. Next, the difficulty was the high heat value of one did not occasion an equal heat balance in these two systems, so that they could eliminate thoroughly or could control within satisfactory limits the radiation factor. They tried a very considerable time with acetylene gas, and with the acetylene burner and care it was possible to get a complete combustion of acetylene. The ease with which acetylene could be generated appealed to him somewhat, because calcium carbide is everywhere on the market. But here again came in difficulties, the acetylene so generated, while fairly pure, had a variable of 2 or 3 per cent., and its heat value was very high, causing difficulty in handling the experimental work; but both these main difficulties were eliminated in the matter of hydrogen. Instead of being too high, it is ½ as high as they would like to have it, and the degree of purity with which it could be generated in this way was much in excess than anything else they know of. In fact, the purity of hydrogen was investigated quite thoroughly in the laboratory at Harvard. They had made many analyses of the gas, and in the matter of purity it proved very satisfactory.

Mr. Danforth asked if instrument was ever checked, by using, say, hydrogen, as a standard and getting the value of some other gas having a known value.

To this the Professor replied, "No, unless you can say that that 3 cornered test with the Junker on pure hydrogen, and getting its factor for hydrogen, and then turning around and using that hydrogen with city gas in this instrument would be that kind of a test. We have a comparison as between this instrument and the Junker in its value for hydrogen, but there would be no way except getting the value of hydrogen by some standard method, or some accepted value for hydrogen. We really are doing what you say. It must have been run by some instrument or in some way run by an instrument you choose. Then we are really running this instrument against that instrument."

A Member suggested perhaps Mr. Danforth meant whether he had tested other gas (for instance, marsh gas, or carbon dioxide), and found whether the result the Professor obtained differed from those hitherto accepted.

To this the Professor said no specific series of tests of that kind had been made, except that in a run on natural gas, which on analysis showed it to be a certain per cent. of purity of marsh gas, for that gas would be so much, he didn't remember the exact figures. When they ran that gas—it was from the west part of the State—against pure hydrogen, it dropped down from the theoretical value of marsh gas exactly to correspond with the variable per cent. of purity. One may say it is simply analyzing a gas and calculating its value. That was a 99 per cent. pure marsh gas, which allowed of but little error in the calculation of its value.

Mr. Thwing said in case one was required to report on the net heat value of the gas by this apparatus, one would have to depend on the analysis of the gas? They had no means of getting the net value? To which the Professor replied the only way, as it seemed to him, of getting at the heating value was to analyze the gas.

A Member thought that was one of the important points of the instrument. He believed the gross value should be borne in mind, not the net value, at all.

Mr. Eves asked Prof. Parr for information as to where the Parr calorimeter could be obtained and its probable cost?

The Professor said the manufactories were in East Moline, Ills., and the makers had sent out a booklet giving their directions for the use of the instrument, and from that booklet one could get a pretty good idea of the construction and manipulation of the instrument. The list price of the instrument was $300. A disappointment to him in connection with the instrument was the amount of mechanical skill that had gone into it. When he first began to work out this idea (1906) it seemed to him an exceedingly simple proposition. The manufacturers, however, found the amount of work far beyond any-

thing that he had supposed, and this ran the cost to a figure quite disappointing to them, of course, because he would rather see the instrument in use than in the show case.

Mr. Graf said if he understood this calorimeter, as long as those two cylinders were absolutely the same, the readings of the actual B.T.U. gas, according to a calorimeter of that kind might be wrong and still get correct results. Any errors in one cylinder, if the error in each was equal, would not affect the result, and one could still get correct readings. If one should run hydrogen in both cylinders, he would get a like result in both, provided the cylinders were both the same. If not the same, about what per cent. of inaccuracy would there be? Was it necessary to let the instrument stand after filling the gas tanks for a sufficient time to equalize the temperature of the gases?

The Professor said he was gratified to see they were certainly getting on the inside of some of the most difficult problems they had to work out. One of the methods of checking the instrument was to reverse the conditions. He knew no better method of checking the balance of the two sides than reversing the conditions. They rather used that as a check upon the makers than anything else, and found that upon reversal it had without exception checked exactly. Their method of manufacture was this: The volume of the cylinder is measured in water and read. Now, that was a pretty accurate method, and those are the two things that cover the point, asked about the calibration. Did they notice it was not necessary to know how much, only to know that the volumes are equal. But if there were a little variation it would show in the weight of the water, or in the reversal. With regard to the temperature. If there were any marked difference in that it would be well to wait a little while; but the large tank of water equalized the temperature of the metal and that they very quickly brought the temperature of the gases together.

The Vice-President said he did not want to shut this off, but as they still had the second section of Dr. Parr's lecture, which was very interesting, it would seem fair to give him a little resting spell, which period they could use in getting before the Association the change in one of the amendments introduced this morning. This morning, if they remembered, it was decided to have the annual meeting of the Association changed to the second or third Wednesday in March, but in looking that up it was found that the Illinois meeting is held that month and, as there were many things that might confront them next year, it was thought best to leave the date of that meeting in the hands of the Executive Committee to be decided upon later, so that it could be put in proper form and presented at the morning session of the next day.

Mr. Graf—I was about to say it might be well now to get the sense of the members in reference to the annual meeting, as the Executive Committee might want to be guided to some extent by the sense of the Association.

The Vice-President thought point well taken. They would like to hear from the members as to their pleasure as to the annual meeting. It was thought that January was rather too hard a month for many to get away, and if that was not a fact, they should so record it. If they would prefer to have the meeting later in the year, or in the spring or fall, all would be glad to hear from any on that question. If it does not make any difference to them, they would have to decide it the best they know how.

Prof. Parr then continued the second part of his lecture, on "Surface Combustion." He showed a number of most interesting lantern illustrations of "Surface Combustion" apparatus and experiments, but his explanations and speeches on the subject were not reported.

(To be Continued.)

Recent Patent Issues.

Prepared for the AMERICAN GAS LIGHT JOURNAL by ROYAL E. BURNHAM, solicitor of patents and counselor in patent causes, 833 Bond Building, Washington, D. C., from whom illustrations and specifications of any patent mentioned below may be obtained for 20 cents.

1,015,851. Burner for Incandescent Mantles. A. P. Storrs, Owego, N. Y., assignor to Storrs Mica Company, same place.

1,015,833. Extensible Gas Pipe. G. W. Thorn, Chicago, Ills.

1,015,907. Meter Box Cover. J. P. Ryder, Clarksville, Tenn.

1,015,929. Method of Apparatus for Preventing Gas Explosions. G. Baehr, Ampere, N. J., assignor to the National Tube Company, Pittsburgh, Pa.

1,015,930. Safety Device for Gas Mains and Holders. G. Baehr, Ampere, N. J., assignor to National Tube Company, Pittsburgh, Pa.

1,015,975. Gas Regulator. A. L. Pickering, Anderson, Ind.

1,016,058. Gasometer. L. Bader, Chicago, Ills., assignor, by direct and mesne assignments, of one-third to W. Bader and one-third to M. J. Detmer, same place.

1,016,100. Automatic Gas and Drain Valve. S. I. Shand, Columbia, S. C.

1,016,133. Gas Producer. T. F. Fitzsimmons, Brooklyn, N. Y.

Items of Interest
FROM VARIOUS LOCALITIES.

THE West Coast Gas Light and Fuel Company with headquarters in Norwalk, Cal., has been incorporated, with the following executive management: President, W. J. McGimpsey; Treasurer, Robt. E. L. Sackett; Secretary, E. L. Jelenik; General Manager, W. A. White. Water gas will be made and distributed under a high pressure plan, which will reach the following settlements: Artesia, Downey and Rivera; Somerset, Belleflower, Hynes and Clearwater. It is understood that the plant will be in working order by May 1st.

AT the annual meeting of the Waterbury (Conn.) Gas Light Company the officers elected were: Directors, C. S. Mellen, S. F. Brooker, J. S. Elton, J. S. Heminway, H. M. Kochersperger, E. A. Buckland, L. S. Storrs, O. S. Northrop and E. H. Williams; President, H. M. Kochersperger; Treasurer, A. S. May; Asst. Treas., T. F. Paradise; Clerk, A. E. Clark; Asst. Clerk, C. H. Hempstead.

THE Barrett Manufacturing Company, of New York City, have agreed on details respecting the construction, at Corey, Ala., of a tar distilling plant, the cost of which is estimated at $250,000. The plans call for (amongst other matters) steel tanks up to storing 2,500,000 gallons of tar, and 1,250,000 gallons of oil; also a 90 feet by 250 feet pitch bay or tank up to holding one million gallons.

THE Albuquerque (New Mexico) Gas, Electric Light and Power Company, is now comfortably housed in suitable offices in the Garcia building, corner of Fifth and Central streets. The Company is carrying on an extensive display of devices and apparatus used in connection with gas for lighting, cooking and heating.

AT a meeting of the Ballinger (Tex.) Business League a proposition was presented by the El Paso firm of Philips & Philips, who offered to install and operate an up-to-date gas plant in Ballinger, provided a suitably-termed franchise could be agreed upon. Mr. A. W. Sledge, Secretary of the League, will furnish particulars.

ACCORDING to the annual statement of the Los Angeles (Cal.) Gas and Electric Corporation it is shown that its assets on gas account amount to $13,028,499.95. In the figuring the franchise is valued at $975,000. The income from sales of gas amounted to $2,592,837.92, the total output being put at 3,241,326,100 cubic feet. The unaccounted-for gas amounts to 10 per cent. of the output. The works are up to supplying a daily demand of 29 millions cubic feet. The main systems cover 981 miles, and of the 96,108 meters in use, 11,336 were added during the year.

BY consent of Counsel the taking of testimony in the Paterson-Passaic gas rate, which was to have been heard some days ago, before the New Jersey State Board of Public Commissioners, has been put over to this date.

AT the annual meeting of the Enterprise Gas Company, held in Egg Harbor City, N. J., the officers elected were: Directors, T. Messinger, Chas. DeLong, J. W. Braunback, Geo. Obergfell, Chas. Blattino, Jacob Oberst, Albert Beyer and Chas. Morgenwick; President, M. Frank; Vice-President, F. W. Bugmann; Secretary and Treasurer, F. Schuchardt; Manager, Samuel Winterbottom; Superintendent of Plant, Fred. Mueller. The yearly reports of the Company showed that it had enjoyed an excellent trade during the twelvemonth. These people also conduct the business of the Atlantic County Electric Company.

MR. G. W. MASSEY, representing the Lambertville (N. J.) Gas Company, recently applied to the authorities of East Amwell for the right to run a main from Flemington to Lambertville, hooking up the settlement of Ringoes, en route.

AT the meeting of the Town Board of North Hempstead, L. I., which was held some evenings ago in Manhasset, L. I., Mr. Eugene W. Denton applied for the right to construct and operate a plant for the supply of gas to the towns of Hicksville and Westbury. The proposition is to operate under the title of the Hicksville-Westbury Gas Company, and to furnish gas at a charge of $1.50 per 1,000 cubic feet, the gas to have a maximum of 20 candle value and a minimum of 18-candles. The plant is to be located midway of the places named, and these names were signed to the petition: Jno. H. Hahn, A. J. Herfort, Chas. A. Raynor, F. Powell, T. J. McCord, P. E. Smith and Jno. L. Berkle. Mr. Denton is anxious to secure the needed permission as soon as possible, in that he says the people named have all the money necessary to carry on the scheme to completion, whereas (he urged) delay may mean that outsiders will try to force the situation. There can be no doubt about it that such an institution would prove a paying venture in the territory named.

THE Riter-Conley Manufacturing Company, of Pittsburgh, Pa., informs us that Mr. W. H. Dickenson was appointed Purchasing Agent for it. His activities in connection therewith became effective last Friday. The Company has also arranged that visitors having business with its purchasing department are to call between the hours of 2 and 3 P.M., unless by special appointment.

THE Keene (N. H.) Gas and Electric Company has determined to extend its mains to and through the streets of West Keene. The expenditure in connection with this will be not less than $10,000.

BEYOND a doubt all will join us in saying "Good enough," over the promotion that has come to Mr. W. B. Tuttle. The great increase in the business of the San Antonio (Tex.) gas, electric and traction properties necessitated a reorganization of the executive management, a feature of which reorganization was the creation of the office of Vice-President, and the promotion thereto of Mr. W. B. Tuttle, who has been the active business or managing head of the concern for several years. A paragraph in the San Antonio *Republic*, making public the changes, contains matter so near to our own views over Mr. Tuttle and his work, that we here reproduce it, in the remark that "So say we all of us": The promotion of Mr. Tuttle gives universal satisfaction and gratification to the people of San Antonio. He has earned their goodwill, not only by his manifestations of public spirit and interest in the upbuilding of our city, but by his constant, tireless, successful efforts to add to their comfort, convenience and safety, through improved service and betterments of the properties under his charge."

MR. E. E. EYSENBACH succeeds Mr. Tuttle in the management of the Traction Company. Mr. Eysenbach, it will be remembered, was for long time prominent in the operating of the Consolidated Gas Company, of South New Jersey, with which corporation Mr. Tuttle really first won his spurs.

"B. B. V.," writing from Woburn, Mass., under date of the 15th inst., says: "Beginning April 1, 1912, the price charged for gas by the Woburn Gas Light Company will be reduced from $1.60 per 1,000 cubic feet to $1.40 per 1,000 cubic feet, with a discount of 15 cents per 1,000, for settlement of accounts made on or before the 15th day of month in which they are presented. This, of course, means gas at $1.25 per 1,000 in this thriving city."

A BRIGHT spot in the proceedings before the Trustees of Fresno, Cal., in respect of their hearings to establish a lower gas rate for that city, was the testimony given by Mr. E. C. Jones, Chief Engineer of the gas division of the Pacific Gas and Electric Company. The gentleman to whom we are indebted for our current information (W. C. E.) says that Mr. Jones quoted figures and related data in proof of his contention that the Fresno folks should be allowed to maintain a $1.25 flat rate for at least another year, in that the proprietors would have to cut off a proposed expenditure on betterment account in Fresno, amounting to $75,000, if the 90-cent rate should prevail. From his figures Mr. Jones showed that the Company's return on its local investment last year was 5.6 per cent., whereas it was legally entitled to at least 7 per cent. His figures from the official appraisement bringing the status of plant to October 31, 1911, by the present controllers, showed: Physical value of plant, $529,345; gross earnings (1911), $164,998; operating expenses, $131,315; total cost of operation, $1134,617; net profit, $30,138.96, or 5.6 per cent. on the physical valuation. Mr. Jones stated that the Company resolved to expend, in 1912, on improving the generating and distributing systems, between $60,000 and $100,000, and, taking the smaller figure as the real one on expenditure account, a sum in excess of the profit for 2 years would be disbursed. In that connection, he claimed the consumption of gas in Fresno decreased perhaps 50 per cent. in the summer months, although during such period the cost of operating was virtually as great as when running at maximum capacity, wherefore practically the only saving was the cost of crude oil that would have been used were the works kept constantly in action at maximum make. Respecting the contemplated improvements he cited it was agreed on to substitute pipes of larger diameters than those now in use under the principal roadways, the substitution to be made without unnecessarily disturbing the surfaces of the roadways. He also noted that the proprietors had in contemplation the construction of an office building that would equal in architecture that of any other business building in the city, a thought that would have to be abandoned forthwith were the rate put at the figure proposed. He also submitted a compilation showing the prices prevailing in 162 cities of the States (41 of the latter) corresponding to Fresno in population, business activities, etc., the figures averaging out these:

	Gross, per 1,000.	Net, per 1,000.
For lighting	$1.40	$1.26
For cooking	1.24	1.20

Only 5 California cities were included in this, and the rates are for both sorts of service: Eureka, $1.25; Pasadena, 80 cents; San Diego and San Jose, $1; Stockton, $1.25.

AT last the Brooklyn Union (N. Y.) Gas Company's people have been successful in securing the premises Nos. 176 and 178 Remsen street, which adjoin its present main office, and which was originally built for office purposes by the now defunct Brooklyn Gas Company, which concern introduced gas in Brooklyn city in 1826. This purchase secures to the Brooklyn Union a plot 100 feet by 100 feet, and thereon will be constructed a modern office building of the most progressive type.

THE New York Public Service Commissioners, Second District, have authorized the Brooklyn Borough Gas Company to issue $105,000, general mortgage 5 per cent. bonds, the stipulations being these: The upset price shall not be less than 90 per cent. of par; the proceeds to be thus divided: Purchase of property and extensions, $76,600; refunding, $7,000; reimbursements, $10,900; commissions and expenses of sale, $10,500. The bonds must be issued before December 31, 1912, and are secured by a general mortgage on all the property of the Company.

MR. E. J. HATCH has resigned the position of Superintendent of the Rochester (N. H.) Gas Light Company. His successor is Mr. Guy S. Babb, a resident of Rochester.

"ISLIP," writing from Babylon, L. I., says that the proprietors of the Huntington (L. I.) Gas Company will on the 1st prox. put the following rate schedule in operation: On lighting account, $2 20 to $1.85; on fuel account, from $1.60 to $1.50; prompt payment will bring into play a rebate of 10 cents per 1,000. Wherefore the new net rates will be: On lighting account, $1.75; on fuel account, $1.50.

AT the annual meeting of the Annville and Palmyra (Pa.) Gas Company suitable resolutions to the memory of Mr. Isaac L. Berkley, late a member of its Board of Directors, were adopted.

THE Public Utilities Commission, of Kansas, has refused to allow an opposition concern known as the Parsons Electric Railway and Light Company, to establish itself in opposition to the Company now doing similar business in Parsons.

AT the annual meeting of the Dover, Rockaway and Port Oram Gas Company, of Dover, N. J., the Ely family seems to have maintained its hold on the concern quite solidly. The executives chosen, as will be noted from the appended list, shonld have small trouble in keeping things in the family: President, Addison Ely, Sr.; Vice-President, Addison Ely, Jr.; Secretary, S. D. Ely; Treasurer, S. H. Ely; Manager and Superintendent, S. H. Ely.

THE Public Service Gas Company, of New Jersey, is proposing to pipe for gas the historic old settlement of Jamesburg, N. J. It will require the placing of 5 miles of pipe to satisfactorily serve the district, and the Company agrees to be in readiness for such service by May 1st.

The Market for Gas Securities.

The market for city gas shares shows little change as between last Friday and this (16th) one. However, there was some animation in the trading, several hundreds of shares changing hands. The net result, as shown by noon quotations to-day, was a loss in Consolidated of ¼ point. On the other hand, there was quite a demand for accredited bonds, with a slow disposition on the part of the holders to accept the current bid figures.

Brooklyn Union keeps well to the point in quotations, although these (138 to 140) are ridiculously low when real values are considered. The Brooklyn folks are to build a model office headquarters on the site now occupied by them, with the addition of a recently acquired 50 feet of frontage. Peoples, of Chicago, is strong; and a like remark applies to Laclede common. This latter is being slowly, silently and continuously going into strong hands, whose grasp on other public matters is of the sort that never tires taking in good things. A notable thing in connection with the management of the Peoples Company, of Chicago, is the resignation therefrom of Vice-President W. P. Martin. He severs his connection forthwith.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

115 BROADWAY, NEW YORK CITY.

FEBRUARY 19.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked*
Consolidated Gas Co.	$78,177,000	100	138¾	139¼
Central Union Gas Co.—				
1st 5's, due 1972, J. & J.	8,000,000	1,000	103	105
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	105	106
Mutual Gas Co.	3,500,000	100	165	175
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	101	102½
New York & Richmond Gas				
Co. (Staten Island)	1,500,000	100	35	50
1st Mtg. Gold Bds. 5 p. ct.	1,000,000	—	98½	100½
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	103	105
Con. 5's, due 1945, J. & J.	1,500,000	—	95	100
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	100	102
Standard	5,000,000	100	60	70
Preferred	5,000,000	100	90	100
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	103	105
The Brooklyn Union	15,000,000	1,000	138	140
1st Con. 5's, due 1948, M. & N.	15,000,000	—	106¾	107
Yonkers	299,650	500	130	—
Out-of-Town Companies.				
Bay State	50,000,000	50	½	¾
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	—
" 1st Mtg. 5's	500,000	1,000	97	100
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
Bonds, 5's	5,250,000	1,000	59	60
Capital, Sacramento	500,000	50	—	35
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed				
Gold Bonds	7,660,000	1,000	104	106¼
Cincinnati Gas and Electric				
Co.	29,500,000	100	87	90
Columbus (O.) Gas Co., 1st				
Mortgage Bonds	1,500,000	1,000	96	98
Columbus (O.) Gas Lt. &				
Heating Co.	1,632,750	100	90½	91
Preferred	3,036,500	100	75½	80
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	13,460,084	—		—
Mortgages, 5's	3,400,000	—		—
General Mortgage 4½	10,661,000	—		—
Con. Gas Co., Baltimore				
City, 4½	2,751,000	—		—
Consolidated Gas Co. of N. J.	1,000,000	100	15	—
Con. Mtg. 5's	976,000	1,000	94	96
Bonds	75,000	—	—	100
Detroit City Gas Co.	6,580,000	—	—	50
Detroit Gas Co., 5's	881,000	1,000	75	80
" Prior Lien 5's	5,619,000	1,000	97	100½
Equitable Gas & Fuel Co.,				
Chicago, Bonds	2,000,000	1,000	—	101
Essex and Hudson Gas Co.	6,500,000	—	133	136
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Light Co.,				
1st Mtg. 5's	1,350,000	1,000	100	101
Hartford	750,000	25	190	200
Hudson County Gas Co., of				
New Jersey	10,500,000	—	135	138
" Bonds, 5's	10,500,000	—	101	106
Indianapolis	2,000,000	—	—	38
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	50	88	—
" 1st Mtg. 5's	290,000	1,000	91	95
Kansas City Gas Light Co.,				
of Missouri	5,000,000	100	—	86
Bonds, 1st 5's	3,822,000	1,000	99	102
Laclede Gas Co., St. Louis.	10,000,000	100	107	107¼
Preferred	2,500,006	100	114	120
Bonds	10,000,000	1,000	102½	103
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	142	145
Madison Gas and Electric Co.				
" 1st Mtg. 6's	400,000	1,000	108	108¾
Massachusetts Gas Companies, of Boston	25,000,000	100	91¼	91½
Preferred	25,000,000	100	98	98½
Montreal Gas Co., Canada	2,000,000	100	218	218¾
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	97	98
Bonds, 6's	6,000,000	—	127	128
New Haven Gas Co.	2,000,000	25	200	—
Peoples Gas Lt. & Coke Co.,				
Chicago	25,000,000	100	106	107
1st Mortgage	20,100,000	1,000	102	102½
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104¾	105½
Pacific Gas and Electric Co.	15,500,000	—	5½	55
St. Joseph Gas Co.—				
1st Mtg. 5's	1,000,000	1,000	96	98
St. Paul Gas Light Co.	2,500,000	100	—	—
1st Mortgages, 6's	650,000	1,000	104	105
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	3,447,000	1,000	94	96
Syracuse Gas Co., N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	101	103
Washington (D. C.) Gas Co.	1,600,000	200	420	425
1st Mortgage, 6's	600,000	—	—	—
Western Gas Co., Milwaukee	4,000,000	—	—	—
Wilmington (Del.) Gas Co.	600,000	50	—	—

MEETING TIMES OF THE VARIOUS GAS ASSOCIATIONS.

American Gas Institute.—Annual meeting, October 16 to 18, 1912. Atlantic City, N. J. Officers: President, Ira C. Copley, Aurora, Ills. Secretary, Geo. G. Ramsdell, 29 West 39th st., N. Y. City.

Canadian Gas Association.—Annual meeting, ———— Officers: President, Arthur Hewitt, Toronto, Ont.; Secretary and Treasurer, John Keilior, Hamilton, Ont.

Empire State Gas and Electric Association.—Annual meeting, New York City, Oct. 1912. Officers: President, R. M. Searle, Rochester, N. Y.; Secretary, C. H. B. Chapin, 29 W. 39th street. New York City.

Guild of Gas Managers of New England.—Annual meeting, March, 1912. Young's Hotel, Boston; monthly meeting, second Saturday. Officers: President, Walter G. Africa, Manchester, N. H.; Secretary, H. K. Morrison, Brockton, Mass.

Illinois Gas Association.—Annual meeting, time, March 20 and 21, 1912, Auditorium Hotel, Chicago, Ills. Officers: President, C. B. Strohn, Elgin, Ills.; Secretary-Treasurer, F. E. Newberry, Dixon, Ills.

Illuminating Engineering Society.—Annual meeting, Sept. ————1912, ———— Meetings of Sections, monthly. Pres't, A. E. Kennelly, Boston, Mass.; Secretary, Preston S. Millar, 29 W. 39th street, N. Y. City. Sections: New York, Secretary, Albert J. Marshall, 16 East 40th street. New England, Secretary, H. C. Jones, 10 High street, Boston, Mass. Philadelphia, Secretary, L. B. Eichengreen, Broad and Arch streets. Chicago, Secretary, A. L. Eustice, 105 North Wabash avenue.

Indiana Gas Association.—Annual meeting, March, 1913, Indianapolis. Officers: President, Howard L. Olds, Indianapolis; Vice-President, Wm. Wallace, Lafayette; Secretary-Treasurer, Phimer Eves, Indianapolis.

Iowa District Gas Association.—Annual meeting, time, May, 22, 23 and 24, 1912; Lincoln, Neb. Officers: President, G. W. Clabaugh, Omaha, Neb.; Secretary and Treasurer, G. I. Vincent, Des Moines, Ia.

Kansas Gas, Water and Electric Light Association.—Annual meeting, time, Sept. 1912. Manhattan, Kas. Officers: President, B. F. Eyer, Manhattan, Kas.; Secretary and Treasurer, J. D. Nicholson, Newton, Kas.

Michigan Gas Association—Annual meeting, time, Sept. ————1912;———— Officers: President, F. W. Blowers, Kalamazoo, Mich; Secretary-Treasurer, Glenn R. Chamberlain, Grand Rapids, Mich.

Missouri Electric Light, Gas, Water Works and Street Railway Association.—Annual meeting, April, 1912; St. Louis, Mo. Officers: President, F. E. Murray, Louisiana, Mo.; Secretary and Treasurer, N. J. Cunningham, Springfield, Mo.

National Commercial Gas Association.—Annual meeting, December, 1912. Atlanta, Ga. Officers: President, C. L. Holman, St. Louis, Mo.; Secretary, Louis Stotz, 29 West 39th street, New York City.

Natural Gas Association.—Annual meeting, May, 1912, Kansas City, Mo.; Officers: President, A. B. Macbeth, Independence, Kas, Secretary, T. C. Jones, Delaware, O.

New England Gas Association.—Annual meeting, February, ————1913. Boston. Officers: President, D. D. Barnum, Worcester, Mass.; Secretary-Treasurer, N. W. Gifford, East Boston, Mass.

New Jersey State Gas Association.—President, William H. Pettes, Newark, N. J.; Secretary-Treasurer, Arthur H. Osborn, Belmar, N. J.

Ohio Gas Association.—Annual meeting, February ———, 1913, Columbus, O.; President, John M. Garard, Columbus, O.; Secretary-Treasurer, T. C. Jones, Delaware, O.

Oklahoma Gas, Electric and Railway Association.—President, Noel R. Gaseho, Alva Okla.; Secretary, H. V. Bozell, Norman, Okla.

Pacific Coast Gas Association.—Annual meeting, Sept. ————1912, ———— Officers: President, W. Baurhyte, Los Angeles, Cal.; Vice-President, Henry E. Adams, Stockton, Cal.; Secretary-Treasurer, John A. Britton, 445 Sutter street, San Francisco, Cal.

Pennsylvania Gas Association.—Annual meeting, Williamsport, Pa., April 8-10, 1912. Officers, President, W. R. Rhodes, Williamsport, Pa.; Secretary-Treasurer, W. O. Lamson, Jr., West Chester, Pa.

Society of Gas Lighting.—Annual meeting, Dec., 13, 1912; monthly meeting, second Thursday. Place, New York City. Officers: President, Fred. S. Benson; Secretary, George G. Ramsdell, 29 West 39th street, New York city

Southern Gas Association.—Annual meeting, April 17-19, 1912, Jacksonville, Fla. Officers: President, H. B. Hoyt, Jacksonville, Fla.; Secretary-Treasurer, E. D. Brewer, Atlanta, Ga.

Southwestern Electrical and Gas Association.—Annual meeting. April 25, 26, 27, 1912, San Antonio, Tex. Officers: President, J. E. Carroll, Beaumont, Tex.; Secretary, D. G. Fisher, Dallas, Tex.

Wisconsin Gas Association.—Annual meeting, May 15 and 16, 1912, Milwaukee, Wis. Officers: President, H. M. Buck, Waukesha, Wis.; Secretary-Treasurer, Henry Harmon, Milwaukee, Wis.